

Rock Products

\$2.00 A YEAR

CHICAGO

FEBRUARY 12, 1919

On January 28th and 29th, the National Association of Sand and Gravel Producers convened in

Chicago. On February 11th and 12th, the National Crushed Stone Association will meet in Buffalo.

Convention Report

February 26th Issue

WAR conditions have given the Rock Products industries **real live organizations**. And now these organizations meet to plan for the biggest, most successful period of the industries. An era of prosperity—in road building and general building—is before them.

They are alive to the opportunities of the times. All agree there will be real labor scarcity of the unskilled, low class type. All look to modern mechanical devices to overcome this scarcity and the high wage problem.

It is estimated that 1,000 new quarries

and sand and gravel plants will open for operation this year.

Some of these plants have been closed during the war. All the owners and operators of quarries, sand and gravel plants, lime, cement and gypsum mills are going to follow the doings of the associations with the keenest interest.

ROCK PRODUCTS February 26th issue will contain a general summary of the proceedings of these two great conventions. It will contain a wealth of material of very vital interest to all the Rock Products industries.

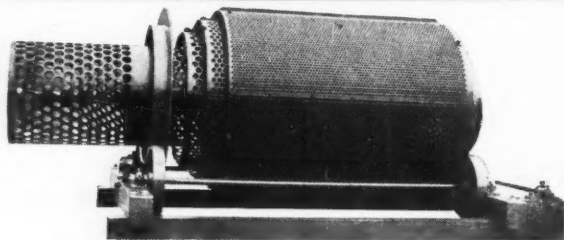
Rock Products

Trade Press Publishing Corporation, Chicago

Stone Screen Sections

CYLINDERS
DUST JACKETS

*Made to Fit All Makes and
Sizes of Revolving Screens*



The O'Laughlin Screen (Patented)

Sand and Gravel Screens

CYLINDERS SCREEN PLATES
CONICAL SCREENS
EVERYTHING IN SCREENS
QUICK SHIPMENTS

Johnston & Chapman Co., 2921 Carroll Ave.
CHICAGO

Universal Crushers

The biggest value for your money. Universal crushers and pulverizers reduce stone to desired size or fineness in a jiffy! Fifteen years of designing and building experience have made possible the exceptional ability of Universals.

Universal Crusher Co.
225 Third Street
Cedar Rapids, Iowa, U.S.A.



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for
Folder
1918

UNIVERSAL CRUSHER CO. CEDAR RAPIDS, IOWA, U.S.A.

"PENNSYLVANIA" Hammer Crushers



For Crushing and Pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

PATENTED
Pennsylvania Crusher Company
New York PHILADELPHIA Pittsburgh

WEBSTER

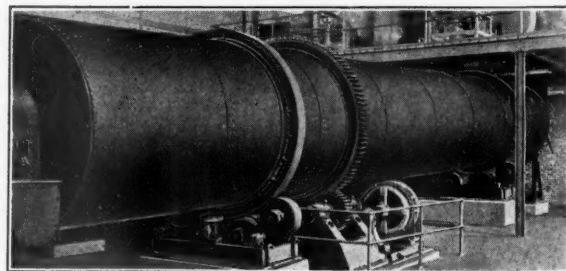
Elevating and Conveying
Machinery

For rock, ore, coal and grain handling and for the movement of materials in bulk or packed. Literature and engineering estimates on request.

WEBSTER MFG. CO., Tiffin, Ohio
NEW YORK CHICAGO

Ruggles-Coles Dryers

for coal, clays, sand, stone, etc. They will burn less fuel than any other type and with their low power and repair costs are most economical to operate.



Built to Dry at the Lowest Ultimate Cost

Ruggles-Coles Engineering Co.

McCormick Building
Chicago

50 Church Street
New York

WORKS: YORK, PENNSYLVANIA

Saying, "I saw it in ROCK PRODUCTS," will bring quick action.

Special—Trial Subscription Offer!!



*This Is the One Useful
Journal Dealing with*

Lime, Cement, Crushed Stone, Limestone, Sand and Gravel

and all products of the

Quarry, Pit and Bank

This journal covers every phase
of these industries—

Production, the Selling end, and
the Business side.

Technical matter on engineering, oper-
ation, machinery, etc., is highly prac-
tical, written in plain English, with a
multitude of pictures.

Whatever is noteworthy in the industry finds a
place in ROCK PRODUCTS' pages, with spe-
cial attention to engineering features and oper-
ating economies.

MARKET PRICES

in every issue, arranged
according to locality. No
more guesswork as to
values.

A very useful journal, a very necessary journal,
to every ambitious man in the rock products
industries.

Rock Products, 542 So. Dearborn St., Chicago

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CUT OUT AND MAIL

ROCK PRODUCTS,
542 So. Dearborn St.,
Chicago:

Here's ONE DOLLAR for a special six
months' trial subscription.

Name

Address

We are going on,

THE Pierce-Arrow factory is going at full speed. It will keep going and Pierce-Arrow trucks will be available for the great reconstruction work that confronts us as they are needed.

The energy that met war problems unflinchingly will meet the great problems of Peace.

Thousands of businesses face the emergency in the same spirit. Pierce-Arrow trucks will serve these—help them to conquer difficulties of transportation greater than those we



PIERCE- ARROW

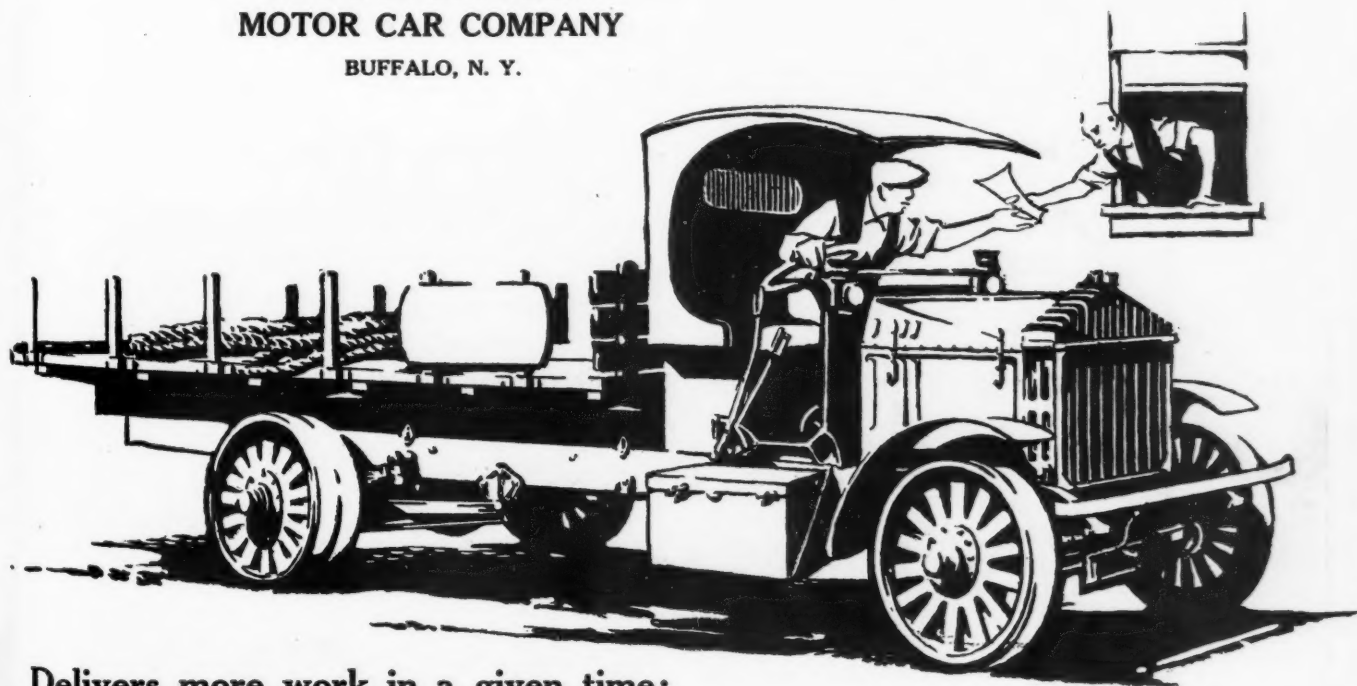
Saying, "I saw it in ROCK PRODUCTS," will bring quick action.

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at full
Pierce-
great
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have conquered. We met successfully every condition of service in 148 lines of business. Call on us for help in expanding or redirecting transportation facilities.

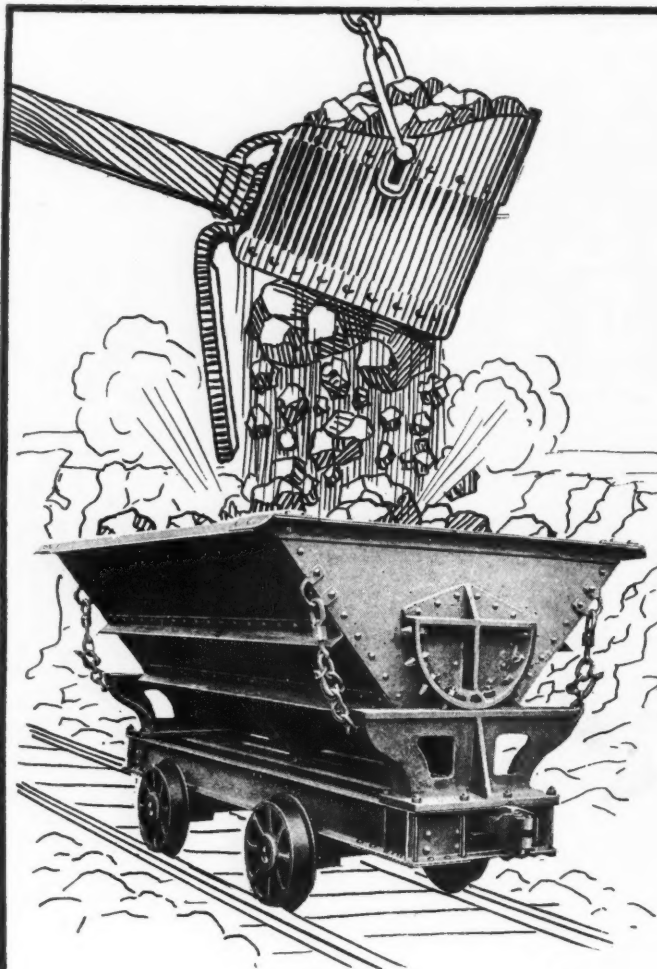
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Peace.
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diffi-
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The greatest opportunity America ever had is before us. Will you take advantage of it?

**THE PIERCE-ARROW
MOTOR CAR COMPANY**
BUFFALO, N. Y.



**Delivers more work in a given time;
Loses less time on the job and off the job;
Costs less to operate and less to maintain;
Lasts longer, depreciates less and commands a higher resale price at all times.**

For better service say, "I saw it in ROCK PRODUCTS."



Steam Shovel Loading

WATT Cars are constructed to withstand the extremely severe service test of steam shovel loading—at the same time meeting the individual requirements of each producer.

Your hauling problem is carefully studied by experts in our engineering department and a special Watt Car is built to suit **your conditions.**

Ask for our catalog today! It shows many designs we have constructed

Watt Mining Car Wheel Co.

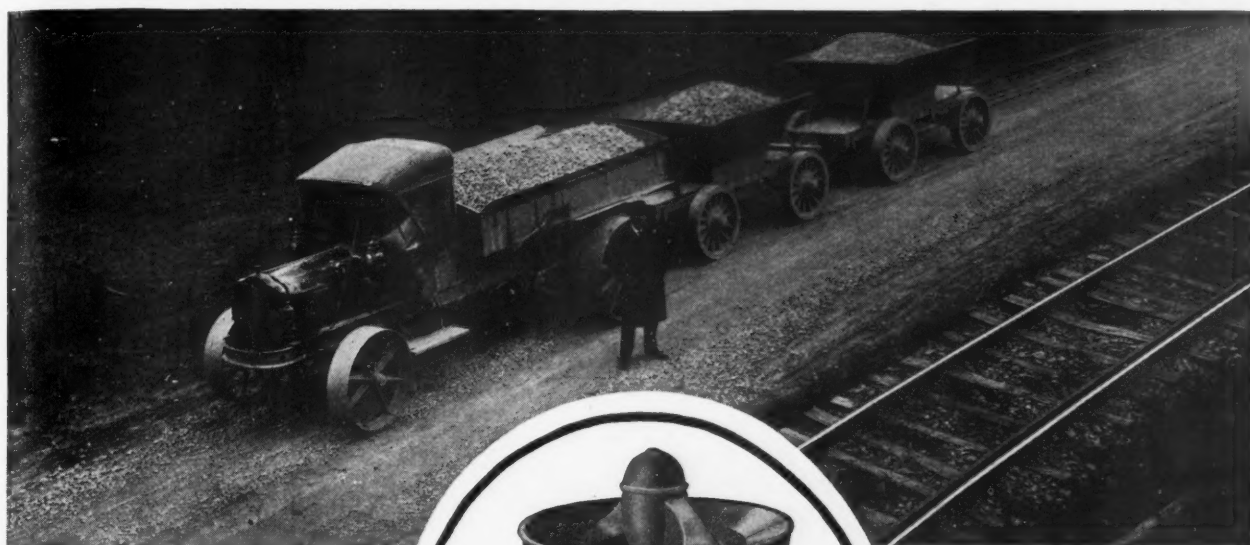
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DENVER
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BOSTON BLDG.

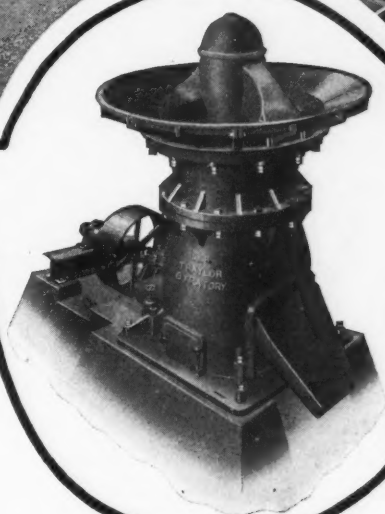
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N. D. Phelps
SHELDON BLDG.

WATT CARS

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.



Now for



Good Roads!

Closely Related—

We are coming to the greatest period of road building and re-building the country has ever known. Crushed stone will be used in enormous quantities. Are you ready to produce your portion and get your share of the profits?

Traylor Gyratory Crushers

are known producers. The proof is many of the most successful crushing plants throughout the country.

Not only are Traylor Crushers superior in regard to production, but they accomplish results at the very lowest known power and upkeep costs.

Learn about the shaft that is 100 per cent

stronger and shorter than others—the eccentric that is both longer and of greater diameter than others—the forced lubrication and numerous other exclusive Traylor features.

We suggest that you promptly get Bulletin R-G 4. It shows the latest improvements in and details of the profit-making Traylor Crushing Plant Equipment. Send for it—NOW!

TRAYLOR ENGINEERING & MFG. CO., Allentown, Pa.

30 Church St.
New York

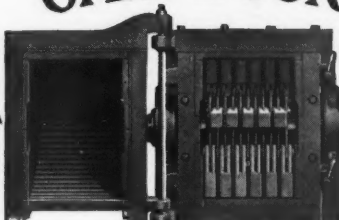
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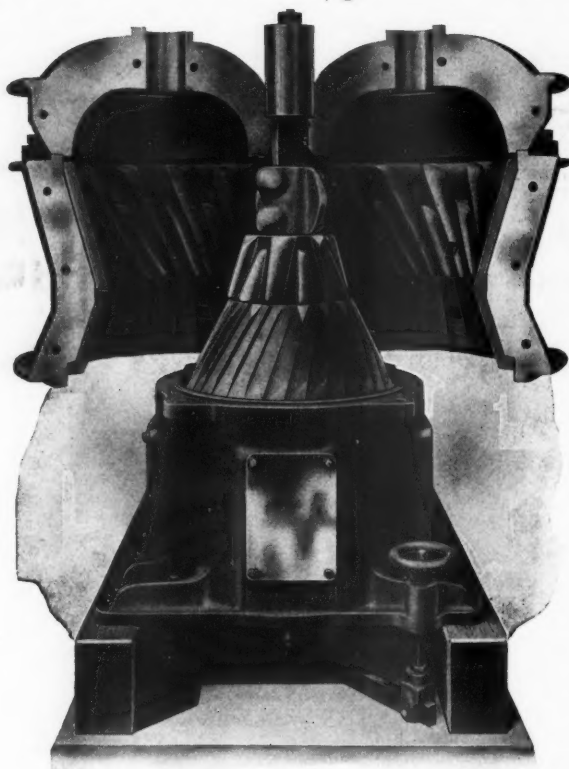
To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry.


"ONE MAN
STURTEVANT

"OPEN-DOOR"

ONE MINUTE"


MACHINERY

"Open-Door" Rotary Fine Crusher



PATENTED

FOR THE REDUCTION OF SOFT AND MODERATELY HARD MATERIALS FROM LARGE PIECES TO 1/2 AND 1/4 INCHES

Unfasten the bolts, throw open the door and get at all wearing parts.
One man can open the door in a very few minutes.

SHUT-DOWNS ARE COSTLY—TIME IS MONEY

"Open-Door" machinery pays because it operates more continuously than any other, therefore production is greater and less time and labor are necessary in case of obstruction or repairs.

BUILT IN FIVE SIZES

Send for Catalogs of Sturtevant "Open-Door" Machines for Crushing, Grinding, Screening, Elevating, Conveying, Weighing and Mixing

STURTEVANT MILL CO., BOSTON MASS.
HARRISON SQUARE

You will get entire satisfaction if you mention ROCK PRODUCTS.



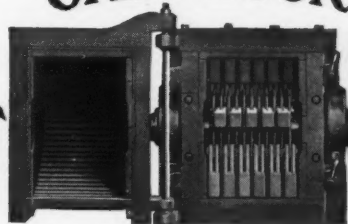
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"ONE MAN

ONE MINUTE"

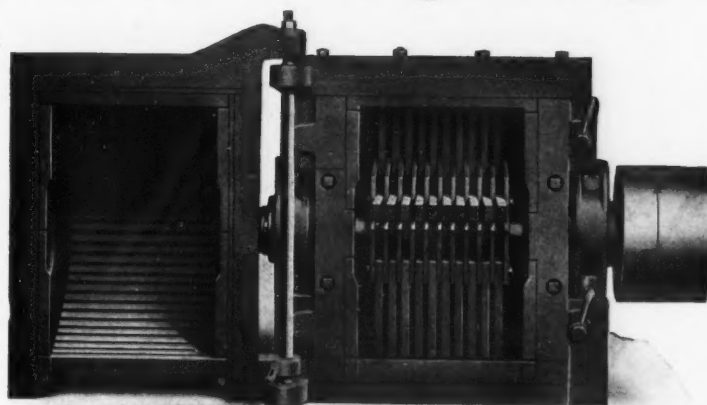


STURTEVANT



MACHINERY

"Open-Door" Swing-Sledge Mill



PATENTS APPLIED FOR

PATENTED

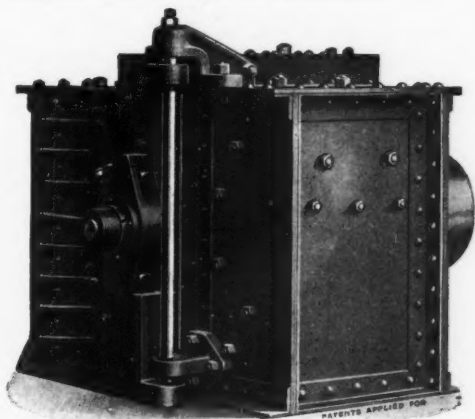
FOR PULVERIZING SOFT AND MODERATELY HARD MATERIALS

"ONE-MAN IN ONE-MINUTE" opens this massive door, through which every part may be reached for inspection, adjustment, repair, or for the removal of iron or other uncrushable substances.

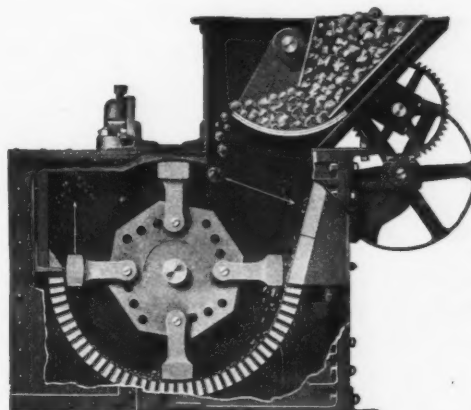
High-speed Pulverizers produce enormous outputs if closely adjusted and kept in repair, otherwise production falls off rapidly.

To repair other mills of this type is a long and difficult undertaking and therefore is generally neglected, and the mills seldom give rated capacities.

There is no excuse for neglect with "OPEN-DOOR" mills, and therefore their outputs are always at maximum.



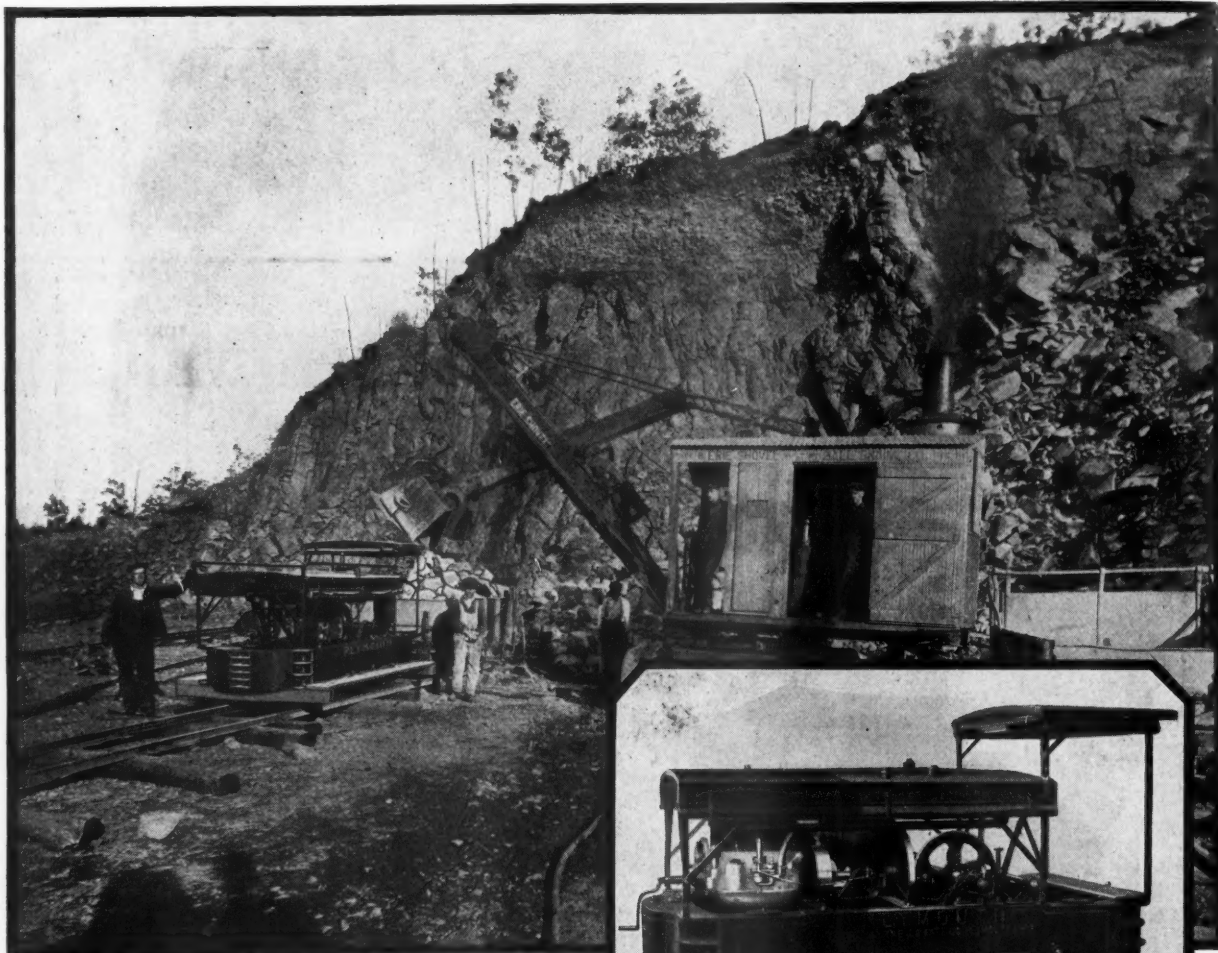
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STURTEVANT MILL CO., BOSTON MASS.
HARRISON SQUARE

It gets immediate attention if you mention ROCK PRODUCTS.



This "business team"—Locomotive and shovel—is doing a big, useful work for John S. Lane & Son, Springfield, Mass. Everybody is pleased with the results.

PLYMOUTH

Gasoline Locomotives

Let "PLYMOUTH" Help Raise the Tonnage at *Your* Plant!

BEFORE John S. Lane & Son, Springfield, Mass., got their "PLYMOUTH" Gasoline Locomotive, their problem was much the same as yours is now, perhaps. They had plenty of material—but needed a cheaper way to get it out.

Their "PLYMOUTH" has proved a mighty good working mate to the shovel shown here—and has helped cut down their operating costs very decidedly.

Just as important is the substantial way that their "PLYMOUTH" has helped this concern to keep going without a break when help got scarce.

Men aren't always as plenty as they were the day this picture was taken—and, when necessary in the Lane plant, a small crew can hustle a surprisingly big tonnage!

"PLYMOUTH" Gasoline Locomotives are doing a big, useful work in quarry, sand-and-gravel, and cement-mill service. We'd like to tell you about it—and to send interesting Bulletins that show, by big pictures, just how "PLYMOUTHs" are serving their owners in many parts of the country. Tell us about *your* haulage and we'll send full particulars, with our compliments.

THE J. D. FATE COMPANY

210 Riggs Avenue

PLYMOUTH, OHIO

New York Philadelphia Norfolk Pittsburgh Cleveland Detroit Chicago Minneapolis Portland

Saying, "I saw it in ROCK PRODUCTS," will bring quick action.



Another
FEDERAL

3½ ton Federal used by the Hampshire Brick Company of Springfield, Mass. This truck has made a remarkable record for economy and efficiency.

"Return loads will cut your haulage costs."

Pile on the big loads —watch the Federal take care of them!

IN THE heavy, trying work—the real haulage "labor"—you will find the Federal right on the job every minute—getting the hard tasks done—looking for more.

Federals are rugged—they are strong—they are durable—they are simple—and finally, but not the least important, they are unusually economical. You can't beat this combination in your haulage work.

Put your problem up to a Federal—and forget it. You'll see a difference at the end of the year when you figure your profits.

Federal Motor Truck Company
43 Federal St. Detroit, Mich.

One to Five Ton Capacities

FEDERAL

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REXALL

DOUBLE

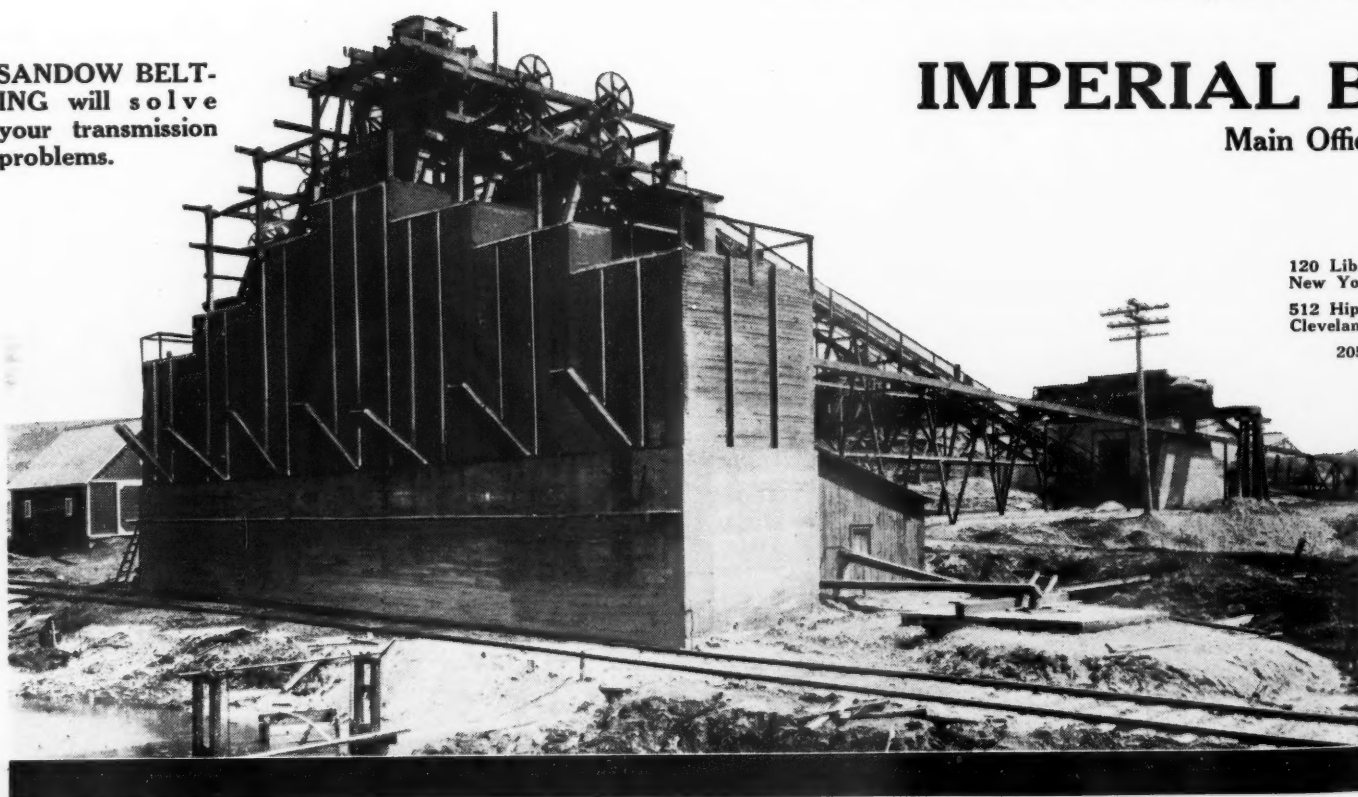
Have Your Belts So

300 feet, 30 inch, 8 ply **REXALL** double-stitched **BELTING** used in the plant shown below. Operating 1248 days in 5 seasons. Carried 1,263,520 tons.

These belts were never taken off the conveyor rollers winter

The selection and rigid inspection of all materials principles of construction are the reasons for the reliability of these and numerous other plants handling massive

SANDOW BELTING will solve your transmission problems.



IMPERIAL BELTING

Main Office—Lincoln and K

Chicago

BRANCH OFFICES:

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112 Ma

Pittsbu

824 Ke

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WARS
CT
ET
NER
GLES
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BELTING

STITCHED

Stood Up Like These?

355 feet, 30 inch, 8 ply REXALL double-stitched BELTING used in the plant shown below. Operating 1232 days in 4 seasons (including dry screening in Winter). Carried 1,062,500 tons.

for roller winter and summer. Names of plants on request.

of all materials and processes together with our basic reasons for the remarkable service given by our belts in handling abrasive materials.

BELTING COMPANY

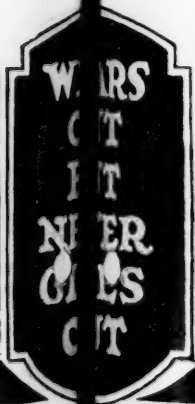
Office—Lincoln and Kinzie Streets

Chicago

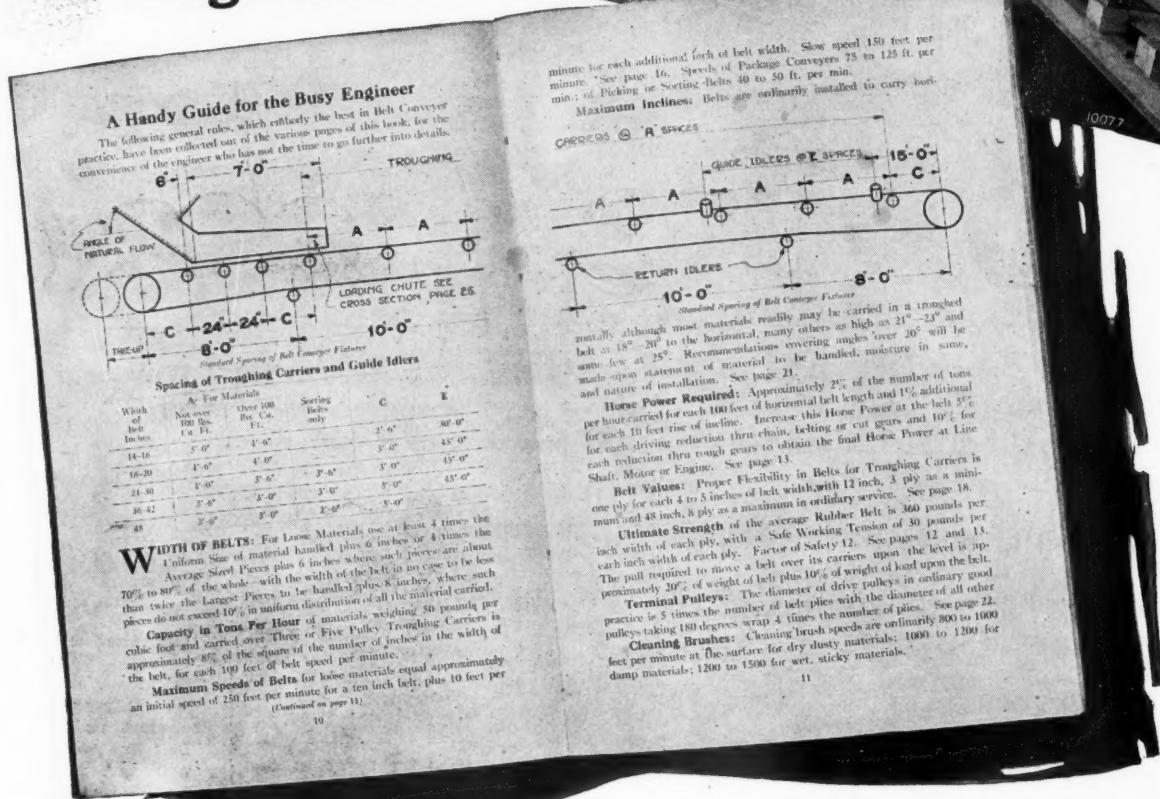
BRANCH OFFICES:

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5-208 Kresge, Detroit, Michigan

Get the full benefit of our wide experience. Write today for samples, data, or consult us upon any belting problems—it will put you under no obligation whatever.



Every Page of Our New Belt Conveyor Catalog Has Valuable Information for Engineers



Take pages 10 and 11 as illustrated above. Here are 9 general rules embodying the best in Belt Conveyor practice, which have been collected out of the various pages of this book, for the convenience of the busy engineer, who has not the time to go further into details.

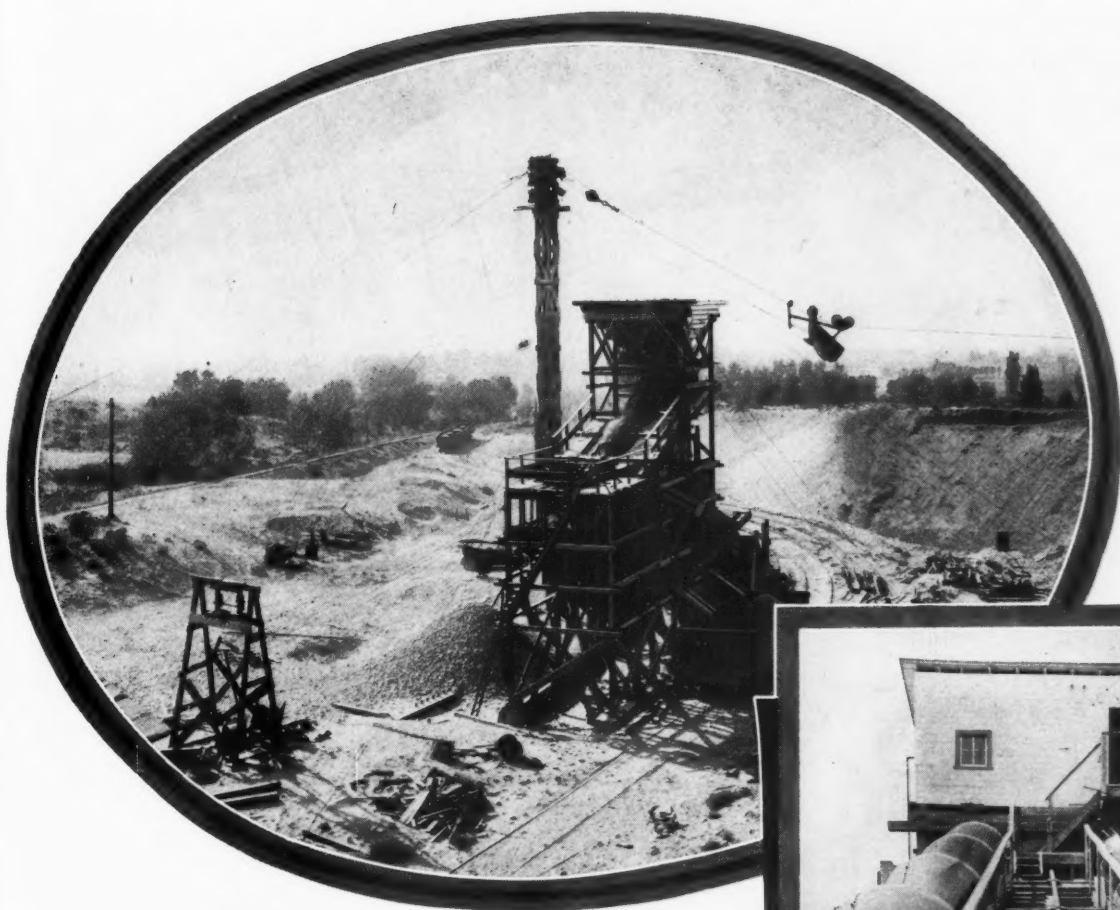
The picture at the top of page illustrates the efficient manner in which Jeffrey Belts and Trippers automatically and uniformly fill large bins or storage space. They are practically noiseless in operation, require practically no attendant labor, occupy small space and require little power to operate.

Write today for your copy of our 80-page Book No. 175-A on Belt Conveyers

The Jeffrey Manufacturing Co.
935 North Fourth Street Columbus, Ohio

Handle it Mechanically

Cooperation is the thing—please mention ROCK PRODUCTS.

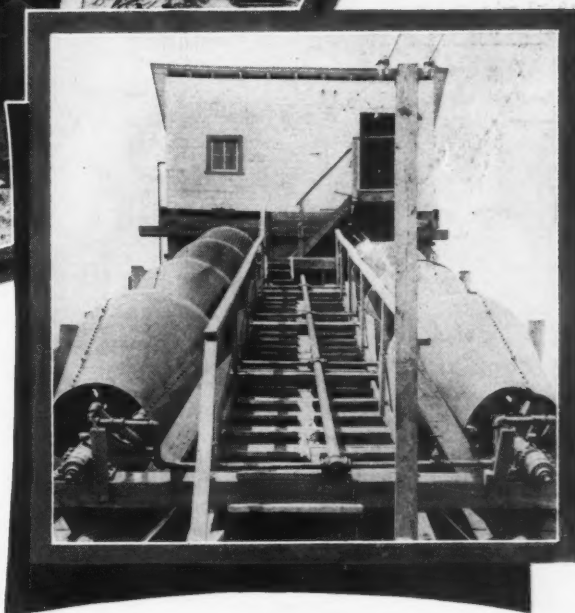


Link-Belt Plus Raymond W. Dull Co. Means Successful Washeries

Sand and gravel washeries must be designed and built to suit local conditions.

To make each plant highly successful requires specialized engineering skill. This skill has been attained by the engineering departments of both the Link-Belt Company and Raymond W. Dull Company as a result of years of specialization, during which time they designed over three-fourths of the modern, successful sand and gravel plants in the United States.

Backing this engineering skill are the adequate manufacturing facilities of the Link-Belt Company for the production and prompt delivery of the entire mechanical equipment for the complete plant, including Conveyors, Scrubbers, Screens, Drag Line Excavator Buckets, etc.



LINK-BELT COMPANY
PHILADELPHIA CHICAGO INDIANAPOLIS

New York, 299 Broadway. Boston, 49 Federal St. Pittsburgh, 1501 Park Bldg. St. Louis, Central National Bank Bldg. Buffalo, 547 Ellicott Square. Wilkes-Barre, Second National Bank Bldg. Cleveland, 429 Rockefeller Bldg. Detroit, 732 Dime Bank Bldg. Minneapolis, 418 S. Third St. Kansas City, Mo., 306 Elmhurst Bldg. Seattle, 576 First Ave. S. Portland, Ore., First and Stark Sts. San Francisco, 582 Market St. Los Angeles, 161 and 163 N. Los Angeles St. Toronto, Can., Canadian Link-Belt Co., Ltd. Denver, Lindrooth, Shubart & Co., Boston Bldg. Louisville, Ky., Frederick Wehle, Starks Bldg. New Orleans, C. O. Hinz, Hibernian Bank Bldg.

LINK-BELT

Gravel Washing Equipment

We Also Make

- ☐ Elevators and Conveyors
- ☐ Link-Belt and Sprockets
- ☐ Silent Chain Drives
- ☐ Truck and Tractor Chains
- ☐ Electric Hoists
- ☐ Locomotive Cranes
- ☐ Wagon Loaders
- ☐ Coal and Ashes Systems
- ☐ Coal Tipple Equipment

Write for Catalogs
Place X in Square

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For More Efficient and Economical Blasting

Our service men have solved thousands of blasting problems, each presenting extraordinary difficulties. Their work has meant better and cheaper results in all sorts of blasting, from slicing off the side of a mountain to making a ditch. ATLAS service works all the time—in quarries, coal mines, ore mines, road and railway construction, tunneling, submarine blasting—anywhere.

A Century's Experience

We have the benefit of more than a century of experience in making explosives. This experience we place at the disposal of every man who has to do with blasting. This service is given without reserve—there are no strings on it. It is service by experts backed by the entire ATLAS organization.

No job is too large, too small or too remote to merit and get the most intimate study and careful personal attention of ATLAS experts.

"Put your blasting problems up to ATLAS" is our standing invitation. It is also the often repeated advice of ATLAS customers to friends who have never tested ATLAS services.

Tests Guarantee Every Pound

There is a proper ATLAS explosive for each blasting requirement. Our own complete chemical laboratory makes tests which guarantee every pound. Each type and grade of ATLAS explosives must be absolutely uniform month in and month out, year after year. Similar blasting results under similar conditions can be depended on always. Rigid ATLAS tests assure continuous satisfaction.

The result of this assurance of uniform quality and our zeal for thorough-going personal service to our customers is thus described by one of our customer-friends: "You are more than mere makers of explosives, you are guarantors of better blasting results at lower blasting cost."

ATLAS POWDER COMPANY

Home Office: Wilmington, Del.

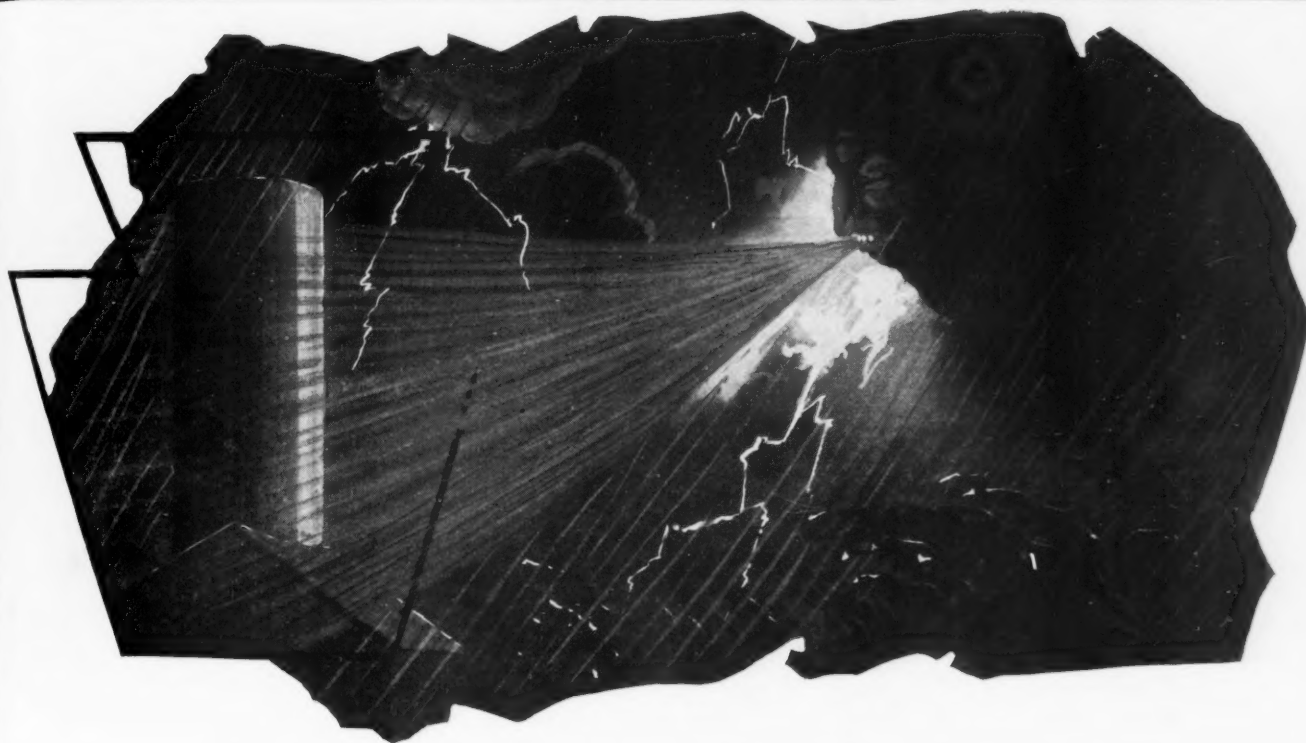
Sales Offices: Allentown (Pa.), Birmingham (Ala.), Boston, Chicago, Des Moines, Houghton (Mich.), Joplin (Mo.), Kansas City, Knoxville, McAlester (Okla.), Memphis, Nashville, New Orleans, New York, Philadelphia, Pittsburg (Kan.), Pittsburgh (Pa.), Pottsville (Pa.), St. Louis, Wilkes-Barre (Pa.)

A PROPER EXPLOSIVE FOR EVERY BLASTING REQUIREMENT

Put your blasting problems up to us

Our Service Department is a clearing house of blasting experience in all its phases and under all conditions. It is directed by experts who will personally help you apply this vast store of information to your own blasting. WRITE TODAY.

Saying, "I saw it in ROCK PRODUCTS," will bring quick action.



***for Five Years the Elements
Sought to Destroy It—But
Today It Is As Good As New!***

FOURTEEN years ago we erected a Keystone Kiln for the Montgomery Lime Company, Houchins, Va. Nine years later the stone supply ran out. The quarry was abandoned. From that time on, the

Keystone Kiln

has been exposed to the elements with an uncovered top. Rain, snow, hurricanes and freezes all tried to wreak destruction on the deserted kiln. But to no avail.

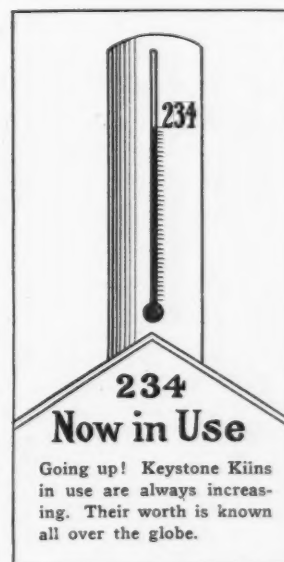
Today the sturdy giant is as good as new!

It is going to be moved by the Kimbalton Lime Co. sixty miles to a new site, where an additional Keystone Kiln will be installed to meet the increased-production program.

Here you have absolute proof of the rugged durability of Keystone Kilns. And note that the kiln is going to be moved. No other kiln on the market can be moved from one plant to another.

Our Catalog Gives Complete Information

Steacy-Schmidt Mfg. Co., York, Pennsylvania



Sterling

TRUCKS

2½, 3½, 5-ton and super-sizes

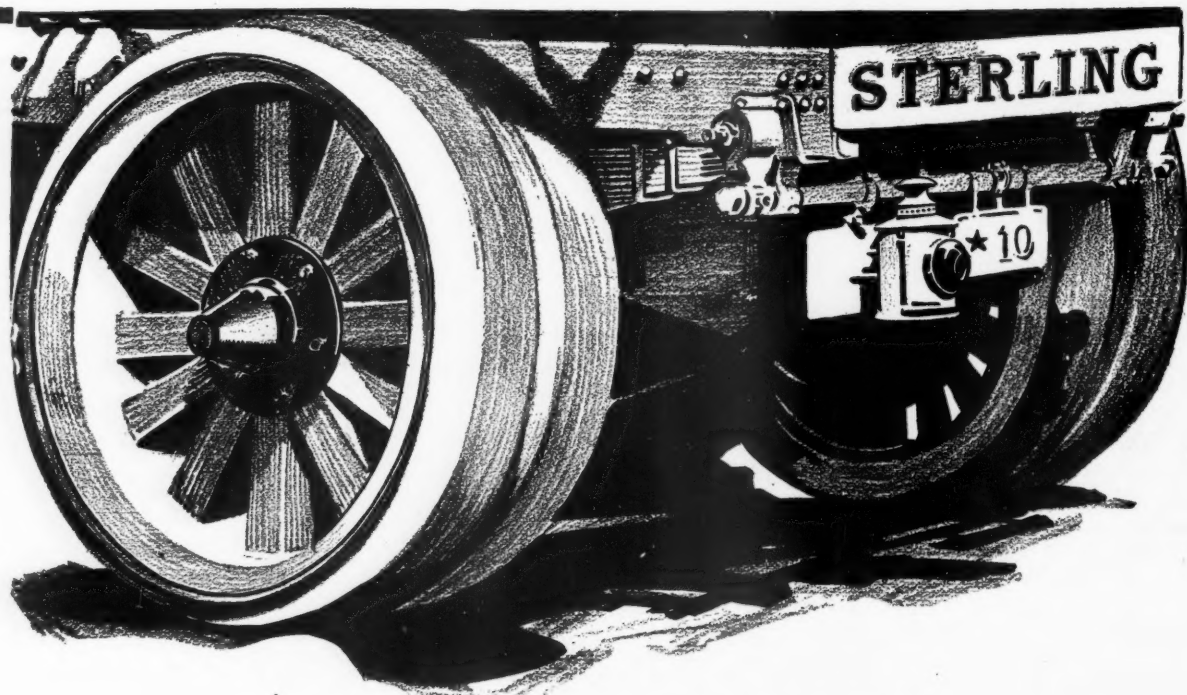
Made good to make good on the job
and on time—in blizzard or sunshine
—on good or bad roads.

"Let's Talk Sterling" is a little booklet you'll like to read because it explains in simple English the scientific construction which gives the Sterling supremacy in your truck class.

STERLING MOTOR TRUCK COMPANY

MILWAUKEE, WISCONSIN

Builders of Motor Trucks Exclusively for Eleven Years



You will get entire satisfaction if you mention ROCK PRODUCTS.

Rock Products

TRADEPRESS PUBLISHING CORPORATION
542 SOUTH DEARBORN STREET
CHICAGO

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Eastern Representative

Vol. XXII, No. 4

February 12, 1919

Table of Contents

Editorial	19-20
Freight Rate Hearing a Hot Indignation Meeting	21-22
Quarry Plant with Some Unique Details	23-26
Wisconsin Mineral Aggregate Association Prospers	27
Growth of Crushed Stone Production	28
Stagnation or Prosperity?—A Suggestion for a Freight Rate Schedule	29
Official Statement on Railway Rate "Revision"	30
Sand and Gravel Men in Big Convention Profit by Organization and Co-operation	31-33
Report of Secretary of National Association of Sand and Gravel Producers	33-36
Cement Industry of the Lehigh District—Part Two	37-40
United States Department of Labor Says No Freight Rate Increases	40
Lime Production in 1918	41-44
Lime Convention Postponed	44
New Machinery	45
Wholesale Prices of Crushed Stone and Agricultural Limestone	46
Wholesale Prices of Sand, Gravel, Glass and Foundry Sand	47
Treasury Department Holds Up Building Contracts Pending Appropriations	48
Passed by the Screen	49

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Allis-Chalmers Mfg. Co.	58	Co.	51	Sauerman Bros.	53
American Pulv. Co.	61	Imperial Belting Co.	10-11	Schaffer Eng. & Equip. Co., The.	63
Arnold, Valentine	14	Jaite Co., The.	51	Smith Eng. Works.	18
Atlas Powder Co.	14	Jeffrey Mfg. Co.	12	Steacy-Schmidt Mfg. Co.	15
Audubon Wire Cloth Co.	53	Johnston & Chapman Co.	12	Stephens-Adamson Mfg. Co.	58
Ball Engine Co.	55	.....	Inside front cover	Sterling Motor Truck Co.	16
Beaumont Co., R. H.	54	K.-B. Pulverizer Co., Inc.	55	Stroh Steel Hardening Co.	63
Byers Machine Co., John F.	52	Kissel Motor Co.	62	Sturtevant Mill Co.	6-7
Caldwell, H. W., & Sons Co.	54	Leschen, A. & Sons, Rope Co. ....	.....	Toepfer Sons Co., W.	52
Chalmers & Williams.	64	.....	Inside back cover	Taylor Engineering & Mfg. Co.	5
Chicago Perforating Co.	52	Link-Belt Co.	13	Tyler, The W. S., Co.	59
Classified Advertising	51	Locomotive Pulv. Fuel Co.	53	Universal Crusher Co. ....	.....
Cleveland Wire Cloth Co.	56	McMyler Interstate Co.	53	.....	Inside front cover
Continental Car Co.	Inside back cover	Miscampbell, H.	60	Urschel-Bates Valve Co.	Back cover
Cross Eng. Co.	55	Northmann-Duffke Foundry Co.	52	Used Equipment	50
Dunning & Boschert Co.	52	Ohio Locomotive Crane Co.	52	Vulcan Iron Works.	57
Du Pont, E. I., de Nemours & Co.	56	Pennsylvania Crusher Co. ....	.....	Waterbury Co.	61
Erie Steam Shovel Co.	55	.....	Inside front cover	Watt Mining Car Wheel Co., The.	4
Fate Co., J. D.	8	Pierce-Arrow Motor Car Co.	2-3	Webb City & Carterville Foundry	.....
Federal Motor Truck Co.	9	Portable Mach. Co.	57	& Machine Co.	54
Gifford-Wood Co.	53	Ruggles-Coles Eng. Co. ....	.....	Webster Manufacturing Co. ....	.....
Gruendler Crusher & Pulv. Co.	52	.....	Inside front cover	Weller Mfg. Co.	60
Hendrick Mfg. Co.	54	.....	.....	Worthington Pump & Mach. Corp.	57
				Yates, Preston K.	59

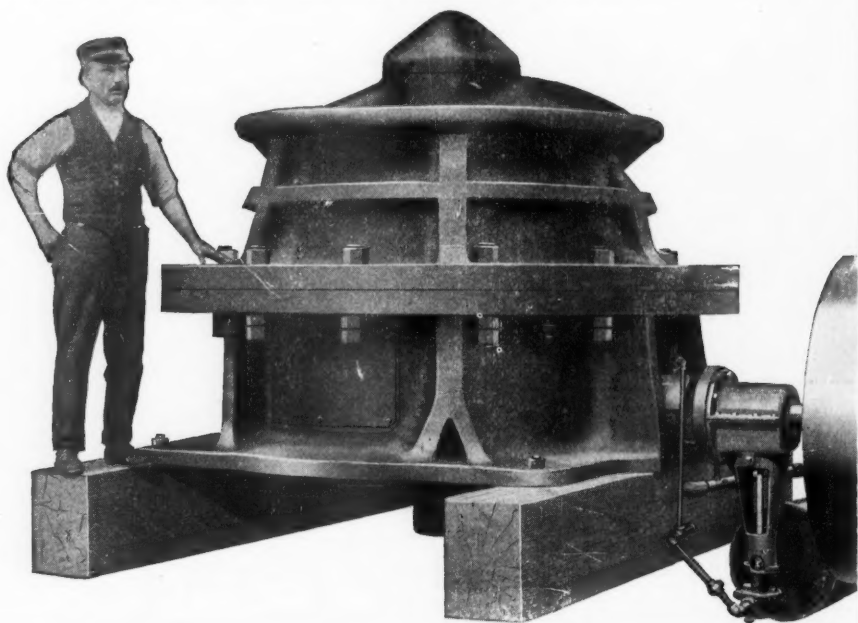
FROM STEAM SHOVEL SIZE



The No. 9 Tel Smith Primary Breaker (upper picture) breaks the ore as it comes from the mine. It has six distinctive features which are not found in any other breaker. They are:—(1) short, stocky frame; (2) rigid shaft; (3) big crushing bowl; (4) enormous eccentric bearings; (5) automatic oiling system; (6) parallel head movement, with the full stroke exerted on the big lumps as they enter the bowl. This machine produces crushed rock at a lower cost per ton than any other device known to the trade. Glad to send you catalog No. 166.

The No. 4 Tel Smith Reduction Crusher (lower picture) follows the No. 9 breaker, re-crushing to $\frac{3}{4}$ in., 1 in., or $1\frac{1}{2}$ in. One machine will crush 60 to 75 cu. yds. per hour to 1 in. size. Two machines, with grizzlies to by-pass fines, will re-crush all the material that the No. 9 will produce. The No. 4 Reduction Crusher is a simple, massive machine of the pillar-shaft design. The enormous open feed hopper will take No. 9 product by gravity without an automatic feeder. It cannot be choked; takes very little head-room; requires only 50 hp. Tramp iron will seldom damage it. Put this crusher beneath a storage bin and let the ore run into it. Keep the oil tank clean and full. Tel Smith will do the rest. Write for our bulletin No. 4F11. Address Smith Engineering Works, 3188 Locust Street, Milwaukee, Wis., U. S. A.

DOWN TO ONE INCH SIZE



District Offices:

30 Church St., New York City
110 W. Park Way, N. S., Pittsburgh, Pa.
930 Oliver Bldg., Boston, Mass.
325 W. Main St., Louisville, Ky.
208 N. Third St., Columbus, Ohio
Garfield Bldg., Cleveland, Ohio
Franklin and Channing Aves., St. Louis, Mo.

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry.

Rock Products

Vol. XXII

Chicago, February 12, 1919

No. 4

Public Works or Public Charity?—Shall the Railways Stifle Industry?

If the Federal Government Is Sincere in Its Professions to Prevent Unemployment and Anarchy, Here Is the Place and Now Is the Time to Prove It

EVERY DAY THE MAILS are flooded with propaganda of the U. S. Department of Labor pleading with employers to keep labor employed, begging the public to build and to improve its properties, and to do these things now! Scores of able and talented lecturers and after-dinner speakers are touring the country for the same purpose, holding aloft the bloody sceptre of Russian bolshevism as a warning, if industry is not revived. Special bureaus of the War Trades Board and other governmental agencies have been created to urge and to plead and to argue for building, building and more building.

The Federal Government itself is planning to

spend hundreds of millions on road improvements, and is urging the states, the counties and the townships to do likewise. Chambers of commerce are devoting valuable time and effort and patriotism to keep the wheels of industry in motion and to take care of our returning soldier boys.

Putting aside all personal and individual considerations, are you producers in the rock products industries, as public-spirited, patriotic citizens going to stand idly by and see the Railroad Administration nullify all these efforts?

Then it is your plain duty to work tooth and nail with your local chambers of commerce, with your local highway authorities, with your



state highway officials, with your state legislature, with the governor of your state, with the congressmen of your district at Washington, and with every other organization and individual in your community, to settle this thing immediately—public works or public charity?—stability and safety in the construction industries, or chaos, and disaster to the contractors bold enough to bid on proposed work.

Chicago Rate Hearing

Take heart in the results of the "hearing" the Central Freight Traffic Committee gave the mineral aggregate producers in Chicago on January 30. They were *heard*, all right, and they will continue to be heard. No railway man or politician (and we think there is not a little politics in this) can ignore public opinion as expressed at that meeting.

The meeting was not all that might have been hoped for. The producers had had no opportunity to come to an agreement as to what rates or what basis of rates they did want. But there was a unanimous agreement that they did not want the rates proposed.

There is a pretty well crystallized sentiment among many producers that a mileage rate, adjusted to properly sized zones and with just charges, would be desirable. This sentiment was expressed in the preliminary report of the traffic committee of the National Association of Sand and Gravel Producers published on page 11 of ROCK PRODUCTS of January 29. But this report was not accepted by the Association as a whole, nor by the committee itself as reconstituted.

The consensus of opinion was that this was no time to change the basis of rates, whatever might be the ultimate benefit; that the stability in industry so necessary at this time should be the only consideration and that this stability could not be preserved by the violent readjustment which must result from a change in the

basis of rates. This is a logical and sane conclusion, and one on which all can agree.

What Are the Railways Driving At?

What have the railway men got up their sleeves? Obviously it is not more revenue, although more revenue is much needed. No railway traffic man is insane enough to believe that there will be any considerable movement of a commodity at rates so greatly in excess of the value of that commodity. And they are aware, too, that there are thousands of empty open-top cars standing on sidings on every part of their lines, which, were they anxious for revenue, they would certainly want to put to some use for the interest on the capital invested if for no other reason.

There seems to be but one conclusion, and that is that they are anxious to make the Railroad Administration as unpopular as possible. They are succeeding admirably, but this step is going a little too far for their own good. They have raised the issue of freight rates and public works, they have placed themselves in the lime-light as blocking the national readjustment movement; and if the other interested parties are alive to their opportunities they will take the fight straight to Washington and have this railway bluff called, and have railway freight rates put into effect which will encourage commerce in building materials instead of stifling it.

Instead of increasing present rates, we believe that Congress and the people of the United States would be perfectly willing to reduce *rates made in 1918 for the express purpose of restricting construction during the war crisis*. They only need to understand (what the railway men themselves know) that high rates on such commodities as mineral aggregates not only will not bring more railway revenue but will actually decrease it, and moreover, will constitute, if agitated at this time, a most serious menace to the industrial life of the nation.

Two Highway Contracts in Ohio Go Begging

BIDS WERE OPENED in Columbus, Ohio, on 14 contracts for state-aid highway work. Two contracts, one for a mile of monolithic brick pavement and one for a mile and a half of waterbound macadam had no bidders. Prices

bid, in general, were pretty close to the engineers' estimates.

The only bid for nearly 12 miles of monolithic brick pavement in Ashtabula County was \$421,418 against an engineer's estimate of \$421,419. At this rate the cost of a mile of 16-ft. brick pavement exceeds \$35,000 per mile. The price bid for 1.36 miles of waterbound macadam in Guernsey County was \$22,-

159 or about \$200 under the engineer's estimate. This is at the rate of about \$16,000 per mile for a 16-ft. road.

Bids on two miles of reinforced-concrete pavement in Knox County ran about \$58,400 or about \$1,000 under the estimate. At this rate the price of a 16-ft. concrete road this season will be around \$30,000. The next letting in Ohio will be on February 28.

Freight Rate Hearing is Hot Indignation Meeting of Mineral Aggregate Producers

Representatives of Central District Freight Committees Hear Their Proposed Rate Schedule Denounced as Bastard, Pro-German and Preposterous from Every Angle

AS SECRETARY SANDLES of the National Crushed Stone Association told the representatives of the Railroad Administration in public, before an audience of about 400 sand, gravel, crushed stone and slag producers, nobody in official Washington has had the nerve to be daddy to the freight rate "revision," which these officials propose to saddle on the mineral aggregates industry of the country, at the most critical stage of our country's history. After listening for three hours to denunciations of this freight-rate "revision" not only from producers but by representatives of the state and local highway departments of Illinois, Michigan, Indiana and Ohio, by representatives of the Chicago Association of Commerce and of the National Federation of the Building Industries—and many other prominent speakers—it looks very doubtful if any one in Washington or anywhere else is likely to come forward as the proud father of this pernicious infant.

Shot Without Warning

The earliest warning any of the vitally interested producers had of what the Central District Freight Traffic Committee had in store for them was on Friday, January 24. The hearing was set for the following Thursday, January 30, so that no one had ample time to prepare the case for the producers. Most of the producers were not notified until the day before the hearing—some received their notices on the very morning of the hearing. So naturally the crowd which gathered in the Red Room of the Hotel La Salle at 11 o'clock Thursday morning were in no gentle, kid-glove mood.

Notwithstanding the very short space of time intervening, the mineral aggregates producers had such a tremendous backing from all sides, that in the few days preceeding the rate hearing in Chicago the legislatures of the States of Ohio and Indiana passed unanimous resolutions condemning the proposed rate schedule, and the highway departments of four states had representatives at the meeting to protest verbally against it.

In presenting the proposed schedule of rates (see page 19, ROCK PRODUCTS,

January 29, 1919) the chairman, J. T. Conley, general freight agent of the Chicago, Milwaukee & St. Paul R. R., Chicago, offered not one word in justification or even in explanation of the proposed rates.

Guy C. Baker Opens Fire

Representing both the crushed stone and gravel men, Guy C. Baker of the Greenville Gravel Co., Greenville, Ohio, opened the argument for the producers in a very forceful and effective way. He expressed regret that the railway men saw fit to pass over the proposed rates without an explanation, because an explanation was certainly due the shippers. He gave in substance the report of the traffic committee of the National Association of Sand and Gravel Producers, which vigorously protested against any increase in rates and demanded a reduction in existing rates, if the Federal Government's own plans and pleadings for a revival of construction work were to be carried out. He gave a resumé of the grievances of the shippers against the Railroad Administration and showed clearly enough the damage the Administration's dilatory measures had already done the mineral aggregates industry and the country at large.

Mr. Baker was followed by the traffic director of the Chicago Association of Commerce, H. C. Barlow, who gave an account of all that the City of Chicago has done to stimulate building construction, to take care of its unemployed, and why these "unjust and unreasonable" freight rates would nullify all those efforts. He referred to rates now in effect in the Chicago-West district, which have been approved at Washington as fair and equitable. These rates are based on a zone system by which hauls of 37 to 48 miles are at the rate of 50 cents per ton and hauls of 50 to 91 miles at the rate of 55 cents per ton.

Mr. Barlow denounced the proposed charges for two-line hauls as absolutely preposterous. Under the present unified Government control he contended there was no such thing as a two-line haul, and that in any event the difference, 40 cents per ton, between a one-line haul and a two-line haul, was out of all proportion to the cost of the service. He said if the proposed rates were applied in the Chicago-West territory (as the chairman assured him they would be ultimately if approved) that increases of about 100 per cent would be the result. He contended that there was no legal authority for increasing any rate beyond the 20 cents per ton increase of last year.

The railways are in duty bound, at this time, he contended, to haul materials at the lowest possible rates. Generally speaking, he said, a mileage scale of rates was not objectionable, but to keep competitive conditions as they are now for the benefit of the consumer he favored a zone or group basis of rates as already adopted in the Chicago-West territory. He said further, that all present rates were predicated on a minimum car weight of 50,000 lbs., which should be changed to 90 per cent of the carrying capacity of the car.

Sandles Makes a Hit

A. P. Sandles, secretary of the National Crushed Stone Association, admirably expressed the sentiments of the gathering when he challenged the railway men to produce the father of this proposed rate scale, and denounced it as a blight and a pestilence on the American construction industry. He quoted from literature of the U. S. Department of Labor pleading with employers to promote prosperity in the building industries; then told of the losses of contractors in Ohio last year because of the sudden increases in freight rates; and then asked the railway men if they thought these contractors were going to be trapped twice in the same way. Mr. Sandles said if there was any one thing the industries needed it was stability. He read the resolutions of the Ohio and Indiana legislatures, and further denounced the proposed rate schedule as an attempt to submarine the construction industries. His speech was received with prolonged applause, which left no doubt as to the opinion of the gathering.

Judge Swango Asks Questions

J. H. Swango, representing the Indiana Sand and Gravel Producers' Association started in by asking the rail-

way committee some questions, from which the following information developed: (1) The territory embraced by the proposed rate scale is that east of the Indiana-Illinois state line, north of the Ohio River, west of the Wheeling-Buffalo line and south of the Great Lakes. (2) Why the mileage scale?—because, the chairman explained, the Railroad Administration wants to charge the same amount for the same service throughout the territory served. (3) The chairman refused to answer whether the contemplated highway construction program for 1919 had been considered in making up the proposed mileage scale. (4) The railway men, by reference to figures of **one part of one railway system**, contended that the proposed schedule was actually a reduction instead of a 40 to 50 per cent increase, as thousands of examples subsequently submitted proved. (5) The Central District Freight Traffic Committee believes the proposal schedule fair and just. (6) The Committee was very anxious to learn whether objections were made to the one-line or two-line rates. It must have been pretty thoroughly convinced before the end of the session that objections were made to both and all.

The railway men contended that the materials did not move long distances, but this was confuted by subsequent testimony. Messrs. W. P. Carmichael, of the Carmichael Sand & Gravel Co., St. Louis, and H. G. Earle, of the Genesee Gravel Co., Detroit, contributed facts and statistics to disprove all the points which the railway men attempted to make.

Freight Rates Add \$4,500,000 to Cost of Illinois Roads

S. E. Bradt, superintendent of highways of the State of Illinois, presented one of the best arguments when he called the railway men's attention to the fact that the present unreasonable rates were put into effect admittedly (by the Railroad Administration itself) to **restrict construction during the war crisis**. These rates added \$4,500,000 to the cost of highway improvement in Illinois alone during the year 1918. Mr. Bradt contended that the proposed rates would stop work on the entire road program of the State, if put into effect.

O. P. Gothlin, of the Indiana Public Service Commission said that the hearing was being conducted topsy-turvy; that the burden of proof was with the railway men to justify such a rate scale; that it was for the Railroad Administration to prove that the rates were justified, if they could! Mr. Gothlin stated that he personally was in favor of a maximum mileage scale, which would do away with much of the present intricate and slow-moving machinery of commodity rate-making.

Frank Bentley, of the traffic depart-

ment of the Universal Portland Cement Co., spoke against a mileage basis of rates and told what the proposed scale on slag and stone would do to his company, which moves about 4,000,000 tons of these a year in making cement. Even on a one-line haul the proposed rates would be 300 per cent over the pre-war rates. Mr. Bentley warned his listeners that a mileage-rate basis was being prepared for the entire country.

J. H. Baker of the Michigan State Highway Department told of the progress being made in that state on a \$50,000,000 bond issue and told how disastrously the state's road-building program would be affected by the proposed freight rate increases. He said that the proposed rate scale would add \$2,500 to the cost for each mile of a 16-ft. gravel road and \$3,000 to the cost of an 18-ft. concrete road.

W. E. Donaldson of the slag department of the Carnegie Steel Co., Pittsburgh, Penn., told of the efforts of the steel companies to develop commercial uses of slag at the request of the Railways themselves, of their success, and of the nullifying effect of proposed freight rates.

Rate on Sand, Gravel, Crushed Stone and Slag					
Rate per Net Ton—Single Line Haul		Rate per Net Ton—Single Line Haul		Rate per Net Ton—Single Line Haul	
Miles		Miles		Miles	
5	45	60	85	175	125
10	55	70	90	190	130
15	55	85	95	205	135
20	60	100	100	220	140
25	65	115	105	240	145
30	70	130	110	260	150
40	75	145	115	280	155
50	80	160	120	300	160

Rate per Net Ton—2 or More Line Haul		Rate per Net Ton—2 or More Line Haul		Rate per Net Ton—2 or More Line Haul	
Miles		Miles		Miles	
5	85	60	125	175	165
10	90	70	130	190	170
15	95	85	135	205	175
20	100	100	140	220	180
25	105	115	145	240	185
30	110	130	150	260	190
40	115	145	155	280	195
50	120	160	160	300	200

R. M. Field, representing the Illinois Sand and Gravel Producers Association referred to the proposed rate scale as an abortion. W. E. McCornack, a Chicago attorney, appeared for the local sand and gravel shippers. He said the proposed increases would deprive the railways in the Chicago district alone of an annual revenue of from \$200,000 to \$300,000. He argued that the original 20c per ton increase of last year should be cut in half. He said it was not a shippers' problem only, but the business man's—there would be no construction work with prices as high or higher than they are today.

B. F. Affleck, president of the Universal Portland Cement Co., appeared in his capacity as president of the National Federation of the Building Industries. He said that such increases in rates were a serious menace to the whole building industry—the second largest industry in America, agriculture being first—and that any addition to the present freight rates would certainly delay projected building work so essen-

tial to the nation at this time. He said the effect of the rates would be to reduce the revenues of the railways instead of to increase them.

W. J. Homer, traffic manager of the Consumers Co., Chicago, told how the proposed rates would tie up much construction work already underway as well as that contemplated in the City of Chicago. H. S. Burchmore, a traffic lawyer of Chicago, appeared for the Illinois Crushed Stone Association. He admitted a wide divergence of opinion on the mileage basis of rates and argued in favor of a group or zone basis.

Building Materials Only Affected

It was officially announced by the railway chairman that the proposed rates affected only sand and stone used for building. They do not affect blast-furnace, glass or sand for other purposes nor fluxing stone used by steel plants. A "revision" of rates on these commodities however, is promised in the near future, and they are exempted from the present schedule only because it is contemplated giving them higher ratings. The same applies to ground limestone for agricultural purposes.

Linwood Stone and Cement Co. Organized in Iowa

DAVENPORT, Ia.—Capitalized at \$250,000, the Linwood Stone and Cement Co., outgrowth of the Linwood Quarries Co., is soon to begin the construction of a new and enlarged plant. Final action was taken by the company at the annual meeting. Articles of incorporation were presented by A. E. Carroll and a new board of directors was elected. They are:

J. F. Schroeder, J. W. Crowley, D. E. Keeler, R. J. Walsh, Otto Hill, A. E. Carroll, Dr. F. Neufeld, all of Davenport; A. C. Klindt of Donahue and A. E. Horst of Rock Island.

The new company has already completed arrangements for the installation of extra large crushing machinery, which is to be added to the machinery already in operation at the Linwood plant. It is expected that this will be installed within the next few months and the company will then be in a position to crush approximately 400,000 cu. yds. of stone annually.

Richard J. Walsh is credited with a large share of the organization work. Much was done during those periods when the financial mind was engrossed with the Liberty loan and war stamp drives.

Work on the construction of the new plant and the installation of the new machinery will begin as soon as the weather permits. This work will be under the supervision of the engineers who have been associated with the quarry plant for the last 30 years.

Quarry Plant With Some Unique Details

Time-Clock Record of All Employees—Cableway Solution of the Ground Storage Problem—Buffalo Cement Co. Also Makes Money from Real Estate Development of Old Quarry

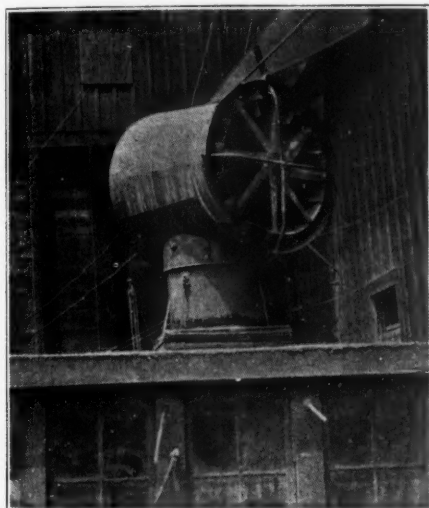
PROBABLY IN ACTUAL CORPORATE AGE the Buffalo Cement Co., Ltd., is the oldest commercial crushed-stone company doing business today. It was organized in 1874 to manufacture "Buffalo" cement and "Diamond" hydraulic lime. This company was a pioneer producer of Portland cement. Also, in 1886, this company operated the first commercial crushed-stone plant in western New York, and probably one

of the first in this country. In that year a contract was made with A. L. Barber of Washington, D. C., for cement and crushed stone for the first asphalt pavements laid in Buffalo, which has since become famous among municipal engineers for these very same asphalt pavements.

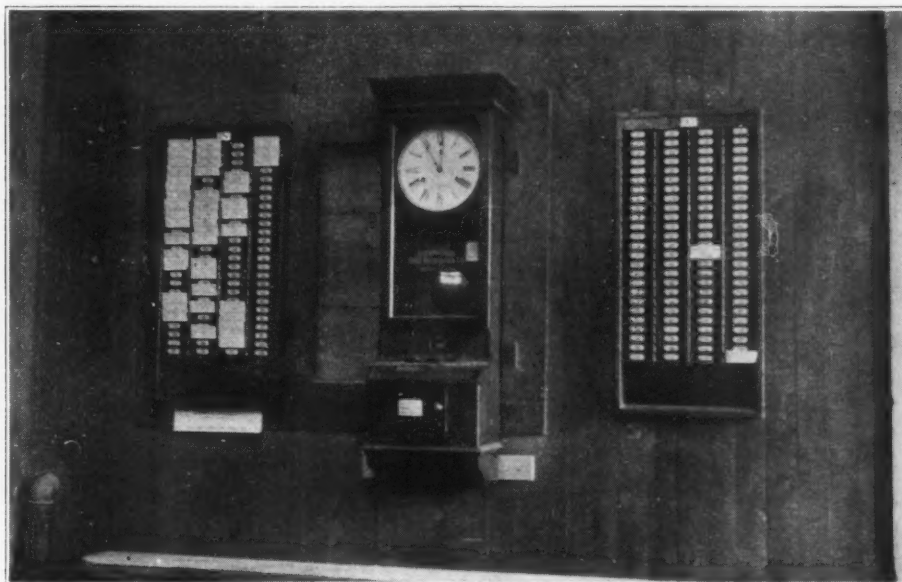
Quarry Operated Continuously Since 1838

The quarry of the company, situated

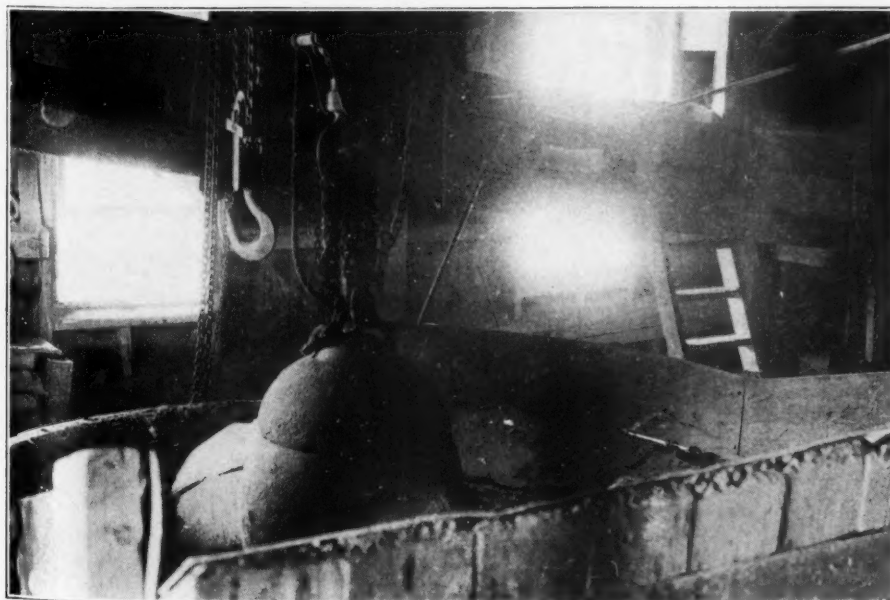
at Main and Amherst Sts., originally contained over 200 acres. This quarry has been operated practically continuously since 1838 and has its part in the up-building of the present great city of Buffalo and western New York State. The limestone quarried is in three strata as follows: (1) "Bullhead" limestone, which has been used as a building stone for many years in some of the most notable buildings in this section—a magnesium



Exhaust fan on roof of motor room keeps stone dust out of bearings



All laborers have time cards—Factory methods in quarry



Crusher set with rim 18 in. above floor, partially boxed in



Side-dumping six-yard cars—Body off-center, dumping automatically by gravity—Dead end track



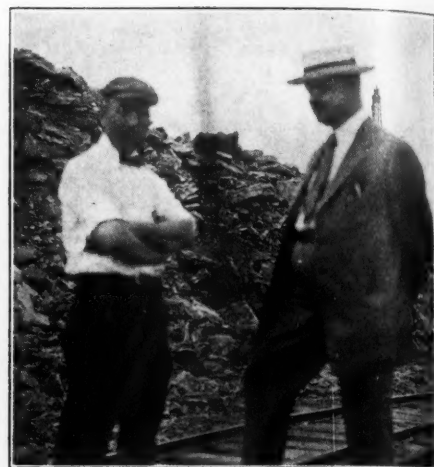
Steam shovels stripping (above); loading stone (below)



Cableway tower; building stone quarry at right



Getting out building stone by the perch for cellar walls, etc.



General Manager Freiberg and General Superintendent Diebold

limestone, French gray in color, and very durable. (2) A flinty limestone containing 45 per cent silica, which is listed by the highway departments of New York, Pennsylvania and the Federal Office of Public Roads as among the best for railway ballast, macadam roads and general concrete road work. (3) Blue limestone, containing very little silica and high in calcium carbonate, which has a high fluxing value and for which the demand has always exceeded the supply—the stone formerly used in the manufacture of cement.

The principal business of the company for many years was the production of Portland and natural cements by mechanical methods devised and patented by Messrs. V. Cummings, superintendent, and Lewis J. Bennett, president of the company. The company's natural cement was very popular and in the seventies and eighties before the era of American Portland cement made by the rotary-kiln process, was very extensively used by both railway and public works engineers. With the rise of the Portland cement industry in the nineties and the revolution in manufacturing methods, the Buffalo Cement Co. ceased operation as a cement producer, dismantled its plant and gave its whole attention to the quarrying and production of building stone and crushed stone.

Real Estate Development a By-Product

The quarry is operated in benches, the first layer of flinty limestone being removed and converted into crushed stone and the second layer of "Bullhead" limestone being largely used for rip-rap or building stone, which is still sold to local building contractors as it was in 1838, by the perch. This quarry enjoys the advantage of being in a large city and adjacent to a fine residential section. It also enjoys the more unique advantage that when the afore mentioned stone is removed, the quarry property has been reduced to a level of the surrounding

building property and its value as real estate consequently is greatly enhanced.

Owing to this fact and also to the fact that the original proprietors acquired several hundred acres of what was then farm land at agricultural land values, much revenue has resulted from real estate operations, and the quarry company is in the unique position of being able to liquidate at any time with a handsome profit to its owners. The city has grown and surrounded the property, some of which has been improved with stores, theaters and apartment houses, still owned and managed by the quarry company.

Quarry and Crushing Plant Operation

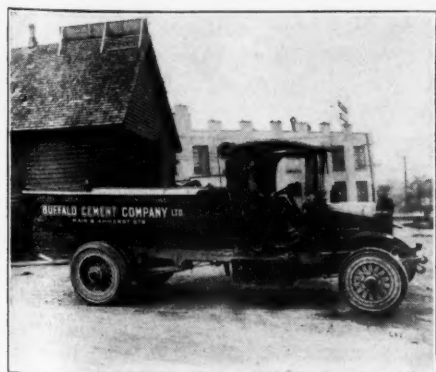
There are no unusual features in the quarry operation. It is a steam-shovel and narrow gage railway proposition. The cars of stone are brought out of the quarry on easy grades and the cars are switched to a dead-end track at the crusher house. The dinky drops a string of loaded cars and returns at once with a load of empties.

The cars are side-dumping, the bodies being hung off-center, so as to dump by gravity on releasing the catch bar. They are hauled into the crusher house one at a time by an electrically operated tow line. When they have been dumped they are dropped back by gravity to a siding alongside the inbound track, where the dinky picks them up.

The initial crusher, a No. 8 gyratory, is mounted a little differently than in ordinary practice. It is provided with an extra wide apron and is set so that the rim of the apron is about 18 or 20 in. above the floor of the crusher house. The crusher attendants working on this floor are thus protected from falling into the crusher by the elevated rim, as by a railing.

Cableway Ground Storage System

Probably the most interesting feature of the plant aside from its history, is the solution of the ground-storage system for finished stone by utilization of a cableway. This cableway is strung parallel to the railway loading tracks and is so arranged that the cableway



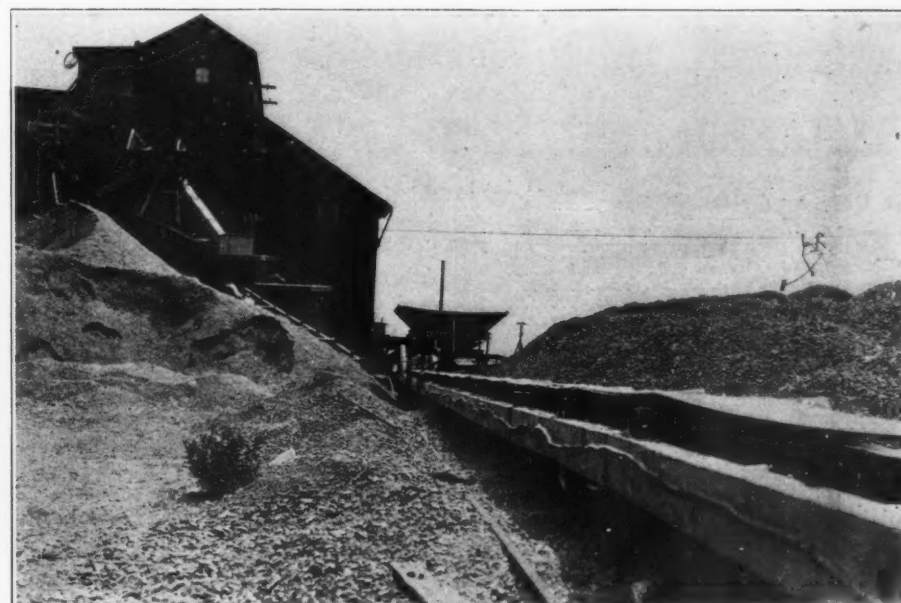
City deliveries by motor truck a specialty



Cableway and traveling crane and clamshell for ground storage



Bin end of cableway—Showing facilities for loading cars



Ground storage recovery by belt conveyor and movable hopper

bucket may be loaded from the same bins used for loading railway cars. The cableway is provided with an automatic stopping and bucket-dumping device, which may be placed at any part of the cableway. One man at the loading end and the tower man can handle a large quantity of material per day at a cost of about 2 cents per ton. For loading out of these ground storage piles both a locomotive crane and a small traction steam shovel are used.

The system described represents a very efficient solution of the storage problem, which is very important in a city crushing plant like this, where a considerable and profitable business can be done in the non-operating season.

For storing and recovering screenings and smaller sizes, which are stored in piles away from the railway loading tracks, belt conveyors are employed. For loading out of these storage piles a small tractor derrick or crane and a grab bucket are employed. This machine loads a hopper over a conveyor belt which discharges into a car or truck at the end nearest the crushing plant. This belt is mounted on a heavy timber framework to any part of which the loading hopper may be moved.

Factory Methods of Operation

The plant is electrically operated throughout. Although old in structure it is very new and up-to-date in some details. It is one of very few quarries which has installed a time-card system for keeping tab on all the laborers employed. This system has been found to work out very well under the conditions.

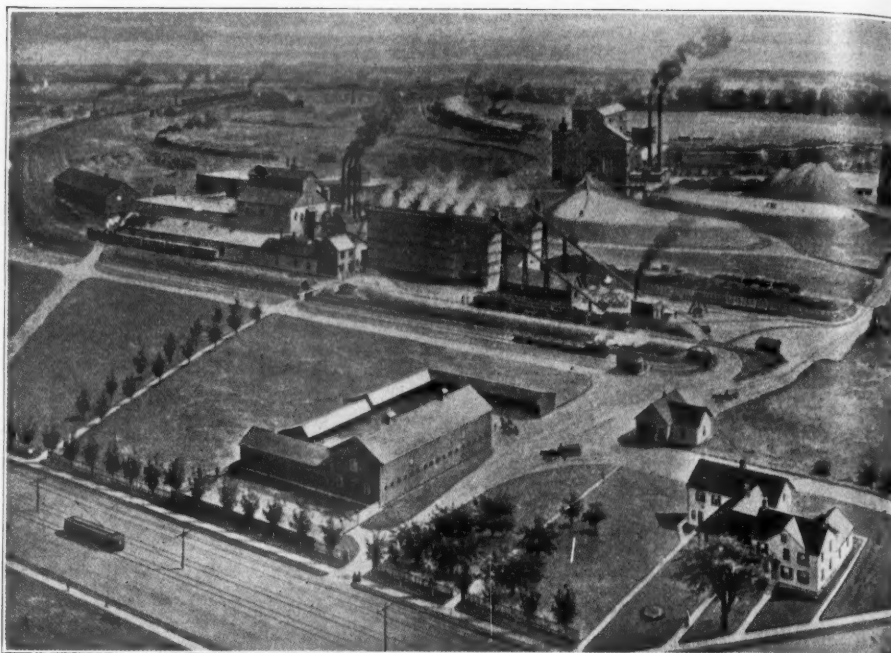
All city deliveries are by motor truck, of which the company owns quite a fleet. C. A. Freiberg, general manager of the company, has kindly volunteered the following data on what it actually costs to operate a crushed-stone motor truck:

COST OF OPERATING MOTOR TRUCK	
Cost of truck complete.....	\$7,200.00
Interest at 6% for one year.....	\$ 432.00
Insurance	171.71
Garage rent \$10 per month.....	120.00
Driver \$21 per week.....	1,092.00
Depreciation .09% per mile 15,000 mi.—1 yr.	1,440.00
	\$3,255.71 Total
Or \$10.85 per day for 300 days.	
Tires (7,000 miles guaranteed for \$579.00).....	.072
Gasoline, 3.5 miles per gal., 23c gallon.....	.065
Motor oil, 200 miles per gal., 40c gallon.....	.020
Lubrication allowance .....	.002
Repairs and Maintenance.....	.035
Average cost per mile.....	.1940

Cost of truck not working—300 days in season.....\$10.85 per day
Cost of truck working—\$0.1940 per mile plus fixed charges of.....\$ 6.55 per day

Officers

The president of the Buffalo Cement Co., Lewis J. Bennett, is one of Buffalo's most distinguished citizens. He was born in 1833 and has been identified with the development of the city since civil war days, when he was collector and supervisor on the Erie canal. Les-



Buffalo Cement Co. plant as it was in its natural cement manufacturing days

lie J. Bennett, a son, is vice-president, and C. A. Freiberg is general manager.

The superintendent of the quarry and crushing plant is F. C. Diebold.

Public Schools Costing \$100,-000,000 Country's Need

F. T. MILLER, Director, Division of Public Works and Construction Development, states that contracts for 800 public school houses, totaling from \$80,000,000 to \$100,000,000 have been held up as a result of the war, according to but a partial tabulation which has been made by the Statistical Section of the Division of Public Works and Construction Development, U. S. Department of Labor.

This is about one dollar per capita throughout the United States. As school buildings are customarily financed on 20-year serial bonds, this means an installment payment of about five cents per capita per year.

Assuming that a decrease of 20 per cent in construction costs might develop during the next four or five years (and this is regarded by many as a maximum decrease), the immediate completion of the Nation's school program would involve an excess of only one per cent per capita per year over the per capita cost, even if construction were delayed for several years.

The educators of the country ask, shall the country have its schools now at five cents per capita per year, or delay having them for four or five years in order to buy them at four cents per capita per year?

To interest the Nation in forwarding this particular work is one of the undertakings of this new division of the Department of Labor. In this purpose

it has the support not only of educators, but of sociologists. They believe that the nation-wide lack of public school accommodations, which is known to all, is one of the earliest problems that must be solved with others that belong to the reconstruction period.

Commonwealth Silica Co. Buys Ottawa Steel Molding Sand Co.

OTTAWA, ILL.—The Ottawa Steel Molding Sand Co. has sold its entire property, consisting of 84 acres, and its personal property to the Commonwealth Silica Co. The consideration is thought to be about \$35,000.

The Ottawa Steel Molding Sand Co. was owned by Pat Clark, Clifford Powers, M. C. Seiter and William Hawthorne, who are retiring from the business.

This land, which is all on Buffalo Rock, is particularly valuable to the Commonwealth people for the reason that it may be operated from the river side of the holding as well as from the railroad side. The company operates a barge line.

The Commonwealth company now owns outright 168 acres and has a perpetual leasehold on 78 additional acres, a part of which holding lies on the Rock Island Railroad and the balance on Buffalo Rock, and forms a solid block of 244 acres, which is estimated to contain upward of 200,000,000 tons of steel molding sand.

Wisconsin Mineral Aggregate Association Prospers

**Second Meeting Gets Down to Brass Tacks and Harmony Prevails
—O. C. Hubbard Appointed Secretary**

SKEPTICS who do not believe that sand, gravel and crushed stone men can work together in peace and harmony should have attended the meeting of the Wisconsin Mineral Aggregate Association in Milwaukee, February 6. The new association is making splendid headway and getting down to the meat of the various problems confronting it. It was unanimously voted to adopt the open-price policy, whereby each member knows the quotations made by every other member.

Other activities of the new association will be a credit-reporting service and active coöperation with contractors to get early action on estimates for public work performed. The association has already begun the collection of cost data, and its tabulation, for the various members, so as to be in an unassailable position when it comes to justifying the season's prices. The importance of this work ought to be thoroughly appreciated by every similar association, for there is a tendency in public works offices to think that the prices of these raw materials are too high.

Operating Costs Way Up

Although some of the cost-of-production figures given at the meeting varied considerably it was very evident that no man who actually knows his costs is producing sand and gravel today in this part of the country for less than 50 cents per ton. The average cost was far higher than this. Nor can crushed stone be produced for less than 90-odd cents a ton under present conditions.

Some figures given for the depreciation of a sand and gravel plant were 10 per cent per annum, which ought to be considered conservative. Depletion was given by the same operator as 5 per cent per annum of the value of the land. Another item which it seems many operators are inclined to overlook is compensation for their own services. As was pointed out it is folly and most unbusinesslike for a man to consider dividends or profits the only compensation he is entitled to if he gives all or a good share of his time to the management of the business. By every rule and principle of business, which apply to the small plant as well as the large one, dividends or profits are the wages of the capital invested and not the wages of the president or general manager whose time and

energy as well as his money goes into the business.

The operation of the open-price policy was discussed in detail and much valuable information resulted. It was perfectly clear that the most value to be derived from such a plan is the increase in goodfellowship and confidence in one another. So successful was the meeting in bringing about this feeling that it was unanimously voted to meet regularly once a month from now until summer.

O. C. Hubbard Made Manager

The new association, which by the way enjoys the distinction of being the



O. C. Hubbard

first Mineral Aggregate Association, has been fortunate in procuring the services of O. C. Hubbard, of the Universal Portland Cement Co., Chicago, as executive secretary or manager. Mr. Hubbard has been with the Universal for a dozen or more years and has had experience in the operating and traffic departments as well as, in recent years, his selling experience. Milwaukee and Wisconsin has been his territory for cement sales during the last two or three years, so that he enjoys a broad knowledge of local conditions and a wide acquaintance

among the local engineers, architects and contractors. Mr. Hubbard will assume his new duties February 15. A handsome office at 332 First National Bank Building, Milwaukee, has already been provided.

Mr. Hubbard made his first appearance before the association at the February 6 meeting, and every one was immediately convinced that the destinies of the new organization had been entrusted to an able manager; which is fortunate for the success of this "experiment," as some of the more conservative choose to regard it, will be watched with interest throughout the country.

Illinois Officials Charge High Prices Will Delay Work

HIGHWAY OFFICIALS in Illinois seem to be laboring under the misapprehension that every one is trying to stick them. They evidently forget that with the exception of possibly depletion and depreciation charge of less than 10 cents per ton every cent in the cost of a ton of mineral aggregate represents Labor. Not until wages go down can they possibly be sold for less than they are today. Nevertheless the Highway Department at Springfield is busy sending out daily propaganda of which the following from the Chicago "Tribune" of February 7, is a fair sample:

Illinois may get into an immediate jam on the state's roads construction policy regarding the \$60,000,000 bond issue, and if it does it will be the fault of the manufacturers of road making materials.

The biggest job that is contemplated by the state, during the reconstruction period, is the building of the 4,000 miles of road authorized by the bond issue.

At present there seems to have developed some gossip leading to the suggestion that the price of materials is being held at such a high minimum that it is prohibitive for Illinois to start upon its undertaking. It is probable that the roads division of the department of public works will say shortly that material prices make the work prohibitive.

No specific charges have been made against any individual, firm, or organization. Nothing more is being said in Springfield, perhaps, than was voiced openly at Chicago in January, when the state highway commissioners' convention served notice on road material manufacturers that maintenance of wartime prices would cause hesitation on large programs of highway construction.

The highway department here seems to be offering every chance to responsible material manufacturers to become reasonable. Unless material prices fall there will be comparatively little accomplished in the broad policy of road construction that has been contemplated.

Growth of Crushed Stone Production —Steady Decline of Building Stone

Diagrams Show Some Interesting Things About the Quarry Industry of the United States

THE VALUE OF EXTERIOR BUILDING STONE produced in the United States was greatest in 1902 and 1906, and since then has declined as a rule and has become practically limited to the facing of the more costly public and office buildings and to trimmings in brick buildings. Curtailment of building in general had a particularly disastrous effect on the production of exterior building stone, as the difficulties with labor and transportation, the high cost of other building materials, and the demand for those materials in other industries or in rapidly constructed buildings for those industries all tended to delay or prevent construction of the more costly buildings.

According to G. F. Loughlin of the U. S. Geological Survey: "The high cost of all structural materials may, however, result advantageously in some respects to the building-stone industry. There are on the dumps of building and monumental stone quarries large quantities of well-seasoned stone rejected because of some minor defect in appearance or because its shape or size were not adapted to the most rapid work in stone mills. If these large sources of stone, perfectly satisfactory as regards strength and durability, can be drawn upon at this time for foundations, inner walls, and exterior walls that do not call for special architectural treatment there will be conservation of both steel and stone.

"It is true that adoption of these uses of stone that has heretofore been wasted may call for change in plans and styles of construction, but when unusual economic conditions prevail changes to meet them are in order. The present crowding of large cities and manufacturing centers is reaching a point that may require additional building, even at prevailing high prices. Many of the buildings required will be small wooden dwellings calling for little or no stone as stone has been used in recent years. Others will be of larger size and of fire-proof materials that can be quickly supplied, but not of the costly type that usually calls for cut stone."

More Likely a Concrete Revival

In spite of the above explanation of the decline of the building stone indus-

try and its future possibilities, a study of the conditions in the building industry since 1906 will convince almost any one that the curves of production of crushed stone and exterior building stone are destined to grow farther and farther apart.

The possibilities of concrete for decorative purposes, as for exterior trim of brick buildings, have been very little developed. Even in this peculiar field of the cut-stone industry there is some reason to believe that concrete will soon be a formidable competitor.

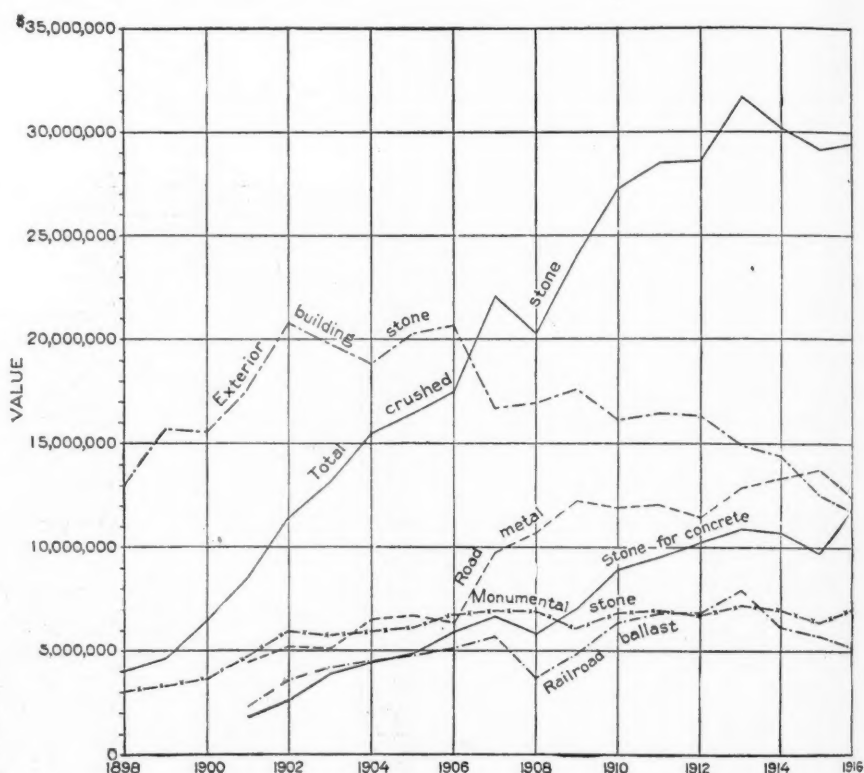


Diagram showing relation of crushed stone to cut stone industry

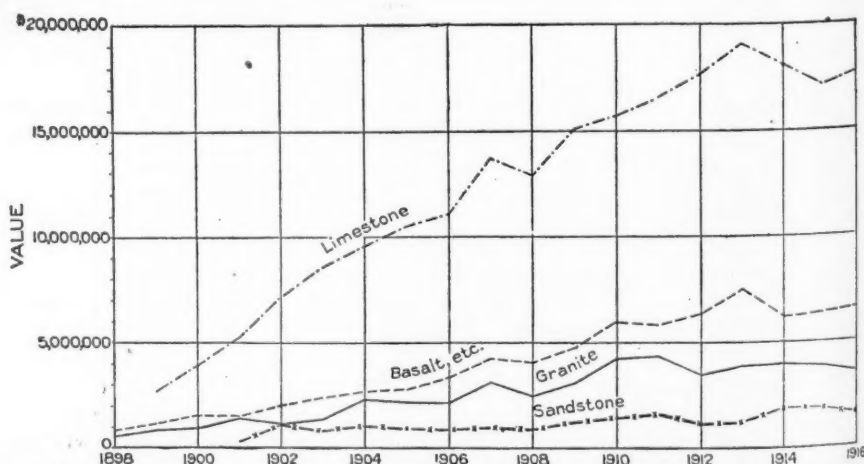


Diagram showing the importance of crushed limestone in the quarry industry

Stagnation or Prosperity

Depends Upon the United States Railroad Administration—
A Proposed Rate Schedule

THE UNITED STATES LABOR DEPARTMENT is sending out men to all parts of the United States begging employers, particularly producers and contractors, to do all within their power to promote public and private improvements, so as to furnish employment for the unemployed, especially the home-coming soldier boys.

At the same time the United States Railroad Administration is asking those very same interests to accept new freight rates that will absolutely prohibit public and private improvements.

These rates are a tremendous increase in many instances over the rates now prevailing; and present rates are very much higher than those prevailing before the war.

It is true that railroad freight rates have had so many cooks that the broth is spoiled both for the railroads, consumers and shippers, but the prescription proposed in the new proposed freight rates would actually spill the broth.

Sometimes an out-sider who knows nothing about a particular business may be able to make a suggestion that can by the expert be put into operation with good effect.

So, I am going to dare to prescribe a remedy in freight rates on the commodities of sand, gravel, stone and slag, which if followed I believe would cure the freight-rate "Flu," if put into effect, or in other words it would unscramble the mineral-aggregate-commodity egg.

I do this as an individual, and not as a member of any organization or owner of any interest in any producing plant.

Elements of Transportation Cost

As I, a layman, see it, there are three principal costs in commodity handling. The On, the Along, and the Off. In other words—the shipping station cost, the mileage hauling cost, and the destination station cost.

For the foregoing reason, I believe there should be three charges combined in one, for every car load of commodity shipped. The On charge, the Along charge, and the Off charge.

The profit to the railroad should all be in the On and Off charges, and the Along charge should be at cost.

This plan would induce railroad companies to promote industries on their lines away from junction points, relieving congestion at these points, so as to get the profits in the On and Off services.

The Along charge at cost is in the in-

terest of the ultimate consumer, for by it, the size of the territory that would compete would be made larger, so naturally it would increase the number of competitors and reduce the prices of the mineral aggregates necessary for public and private improvements.

A two-line haul should cost only enough more than a one-line haul to pay the cost of switching at the junction point, say 10 cents a ton, for the second line would get the profit in the Off charge.

Proposed Rates

On per ton	Along per ton	Off per ton	Total one line per ton	Total two line per ton
20	5-20 miles	20	45	55
20	10-40 "	20	50	60
20	15-60 "	20	55	65
20	20-80 "	20	60	70
20	25-100 "	20	65	75
20	30-120 "	20	70	80
20	35-140 "	20	75	85
20	40-160 "	20	80	90
20	45-180 "	20	85	95
20	50-200 "	20	90	100

I have no idea that this prescription

will be adopted, because each doctor wants the honor of inventing the cure himself, but I do believe the plan if not these particular rates, would unscramble the freight-rate egg, and I hope to see the plan criticised or a better plan suggested in your columns.

Horatio S. Earle,
Ex-State Highway Commissioner
of Michigan.

Death of Pioneer Wisconsin Lime Manufacturer

WILLIAM NAST, president of the Nast Lime & Stone Co., Marblehead, Wis., died January 10. Referring to his death, Robert F. Hall, Manager of the Lime Association writes: "For many years he was one of the outstanding figures in the lime industry in Wisconsin and his loss will be severely felt by his associates in business, and the industry at large has been deprived of wise council and profound experience which it will be difficult indeed to replace. The sincere condolence of the officers, directors and staff of the Association is extended to his bereaved family."

Congress May Increase Limit of Allowance for Federal-Aid Roads

WASHINGTON, D. C.—Under legislation which is now before Congress, the cost limit for roads built with Federal aid will be increased from \$20,000 to \$30,000 per mile. Inasmuch as this legislation provides for no increase in the appropriation for that purpose, however, the increased cost limit will result in reducing the number of miles which may be constructed by the States.

"The expense of highway construction has increased proportionately to everything else," declared the House committee on roads in a report advocating the increase, "and the type of road which five years ago could be built for from \$15,000 to \$16,000 per mile now costs \$23,000 to \$25,000, and, in some instances, \$30,000 a mile.

The total fund available for apportionment among the States is \$30,000,000 as in 1917 and 1918. An additional \$50,000,000 has been proposed for the current fiscal year, making the total funds available \$80,000,000. The allotment for the fiscal year 1920 is \$20,000,000, which it is proposed to increase to \$95,000,000, while the allotment for 1921 is \$25,000,000, which it is proposed to increase to \$100,000,000. This will increase the total

allotment now authorized—\$75,000,000—to \$275,000,000.

For every dollar of this money expended, the State is required to expend a similar sum from its own funds, thus dividing equally the cost of constructing the roads.

Lime Association to Investigate Carbon Dioxide

THE WASTE of CO₂, so important in many industries, has thus far gone on in the lime industry with no effective effort to recover it. In the cement industry, for many years, immense quantities of potash went up the stacks and were lost. Very recently the recovery of this potash has become so profitable that manufacturers have been glad to secure this means of reducing the cost of their main product, namely, cement. It is quite possible that the manufacture of carbon-dioxide will become quite as important in the lime-producing industry. At all events, the subject is one of great importance and will be among the first the Chemical Laboratory of the Lime Association will study.

Official Statement on Railway Rate "Revisions"—So-Called

Former Director General McAdoo Outlines Government Policy—Contends Shipping Public Is Adequately Represented and Protected

IN THAT PART of his annual report on the Railroad Administration covering "public service and accounting", made public January 25, former Director-General McAdoo writes:

The Federal control act invests the Director General of Railroads with authority to establish rates of transportation and regulations affecting the rate upon lines under Government control. The rates and regulations so established are subject in all cases to review by the Interstate Commerce Commission but otherwise can only be altered by the Director General himself.

Rate Structure Preserved

Before the railroads were taken over the increase in the cost of materials and supplies had added to operating costs. Further increases in this direction and large necessary wage increases so enhanced the cost of operation that it was found necessary to make a substantial advance in rates, both freight and passenger, and such increases were made effective after six months of Federal control. In making these advances in freight rates it was endeavored to preserve existing relationships. It is impossible, however, to put into effect such an increase without producing results which require readjustment. There were also in existence previous to Government control many rate situations which were filled with inconsistency and discrimination. All this rendered it necessary to promptly devise some system for the readjustment of rates.

Under private operation carriers had created a variety of committees and associations for the purpose of dealing with this question. These were largely the outgrowth of competitive conditions which required uniformity of treatment. Upon these traffic organizations the public had no representation whatever. The proposed rate was first fixed by the carrier. If not satisfactory it could be subsequently attacked by the public either before the Interstate Commerce Commission or before a State commission. In some States interstate rates were made by the State commission and not by the carrier, but this was not the rule.

No Change Without Public Hearing

It has been felt by this administration that any change in rates, especially any

change which works an alteration in the relationship of rates, should, when possible, be submitted to the parties affected before being put into effect so that the side of the shipper or the public might be presented. To secure this result, it was decided to create traffic committees which might consider all rate changes and upon which the public should have representation, and as a result such committees have been established at various points throughout the country so located as to be conveniently accessible to the shipping public. A majority of those serving on these committees are drawn from the railroad service, but there is in every case at least one representative of the public who has in all respects coordinate authority with his associates.

How Committees Are Constituted

There is first the local committee which consists of three members, two from the carriers and one from the public. To this committee is referred all rate questions of a local character. The committee lists subjects for hearing, gives notice of the time and place when a particular matter will be heard, and listens to whatever any interested party desires to advance. Having finished its investigation it makes a report, briefly stating the issue involved and its recommendation, together with reasons upon which that recommendation is based. This secures an examination of local questions in the locality where they arise.

There are also three general committees, one in each classification territory. These consist of five members, three from the railroads and two from the public. It often happens that a change of rate in one locality may bear an immediate relation to some other rate in some remote locality. With this relationship the local committee may have no acquaintance. The general committee takes a broader view of a much wider field and is in position to determine whether the recommendation of the local committee produces an effect which that committee may not have had in contemplation.

Working of Committees

The procedure is this. All local questions are submitted to the local committee which sends its report to the general committee. Unless the general commit-

tee finds something in the recommendation which in its opinion ought to be corrected, it transmits the report to the Division of Traffic at Washington, sending a copy to the Division of Public Service. Questions not strictly local may be submitted to and disposed of in the first instance by the general committee, which in such event would make its report directly to the Washington office. In some cases the question may be disposed of by the Washington office without the assistance of either the local or the general committee.

Every authority for a change in rates issues from the Division of Traffic at Washington and under the present arrangement no change can be made until that change has been submitted to the Division of Public Service. Every rate change must, therefore, pass under the observation of this division. If not approved it is suspended until it can be discussed and if necessary taken to the Director General for final determination.

In the past thousands of rate changes have been made each month which were worse than unnecessary. These multitudinous changes produced confusion and discrimination. What the shipping public desires above everything else is stability of rates. It is also highly desirable that these rates be published in some intelligible form so as to be capable of interpretation by the ordinary shipper. When no rate is changed except for some substantial reason the number of such changes will be enormously reduced.

Rates on Agricultural Limestone and Flux to Be "Revised"

PROBABLY before the next issue of ROCK PRODUCTS appears a proposed mileage scale of freight rates for agricultural limestone will be submitted to shippers through the various sub-committees of the Central District Freight Traffic Committee. There is some ground for believing these rates will be the same mileage scale as for crushed stone, noted elsewhere in this issue, with 25 cents per ton added to the proposed rates, i. e., 70 cents a ton for a five-mile haul and so on up.

Likewise, similar "revisions" are proposed next on fluxing stone.

Sand and Gravel Men in Big Convention Profit by Organization and Co-Operation

Members of National Association at Chicago Manifest Their Re-Awakened Spirit by Constructive Decisions Made—Attendance Largest in History—Program Interesting and Instructive—Membership More Than Doubles

AN AROUSED INDUSTRY took stock of its difficulties and embarrassments, fixed the responsibility for these conditions and then spoke its determination to right them when on January 28 and 29 the National Association of Sand and Gravel Producers met in annual convention at Hotel La-Salle, Chicago. It was the greatest gathering of sand and gravel men in the history of the industry. For the first time the association felt fully its practical usefulness, its deserved opportunities and its power.

There was encouragement in the great attendance (about 150) and in the growing membership and stimulation in the many spirited discussions.

The threatened freight-rate advance was ever uppermost. Several of the principal addresses dealt with that irritating matter. Other talks and six resolutions dealt exclusively with the railroad problem. But aside from this great question, other subjects that loomed large were organization and co-operation which would bring into intimate relationship the whole mineral aggregate in-



Harry Donnelly, President

dusty. Talks along lines of union and co-operation were made by A. J. Blair, president of the Wisconsin Mineral Aggregate Association and of the National Crushed Stone Association and J. H. Allen, vice-chairman of the Mid-West Association of Mineral Aggregate Producers.

Pollay Urges Resumption of Construction as Country's Dire Need

The convention was stirred by Frank J. Pollay, special agent of the United States Department of Labor, Building and Construction Division, who presented a vivid picture of the dangers in the present industrial situation, the pressing need for a general resumption of construction activity, the opportunities at hand for capital, the matter of unemployment and the danger confronting the nation by delay, the demand and necessity for highways and the means this road construction offers in carrying the nation successfully and prosperously through the period of readjustment, the requirements of railroads, the positive demand for general co-operation between all industrial agencies, for a proper and

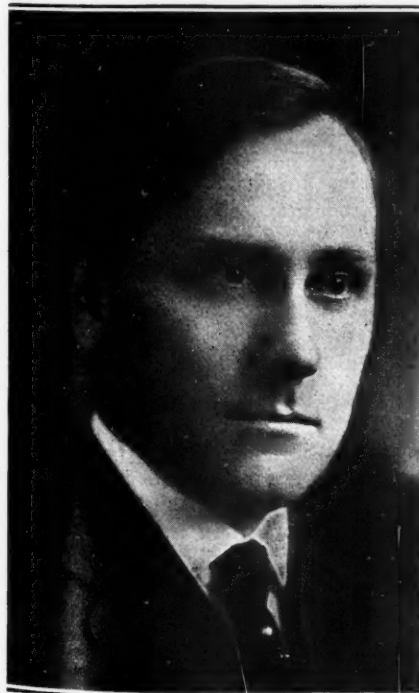
helpful understanding between capital and labor. The Department of Labor is working energetically by propaganda, in speech, in correspondence and in literature to the end that all agencies of production and commerce shall be set in motion as quickly as possible. He emphasized particularly the need of promptness.

The convention thought so well of the speech that the executive committee ordered hundreds of copies printed for distribution at the convention.

Taylor on Labor's Program

"What Is in the Wind of Trade?" was the cryptic title to an impressive talk by Graham Taylor of the Chicago Commons, a specialist on the relations of labor and capital, who interprets each element to the other and many times acts as arbitrator at the solicitation of both, an unquestioned sociological authority who lives among the workers and who associates with employers and who talks with and understands both as perhaps few other men do.

He presented side by side the thoughts and desires of labor and capital in this post-war period. The programs of each



Walter Jahncke, Vice-President



E. Guy Sutton, Secretary

he dwelt on but of the programs of labor both in Europe and in America he spoke of extendedly because these are the things that employers should hear. Gradually he unfolded the aspirations of the workers, not the bolsheviki, nor the extreme socialists but of the semi-conservative group whose program however might appear as radical enough to jolt the ordinary conservative.

He said the programs were not mere platforms of a small group but real demands by powerful groups as the British Labor Party whose power is so great in England that its success in that country is neither impossible nor improbable.

This party declares for

1. The universal enforcement of the national minimum. (A minimum wage for all in good times and bad times alike).

2. The democratic control of industry (including government ownership of railroads, telephones, telegraphs, post-offices, harbors, highways, canals, light and power plants, etc.)

3. The revolution in national finances (income and land value taxation).

4. The surplus wealth for the common good (limitation of inheritance).

Continuing he said that in France a program of similar import had been adopted by a similar party and in the United States like action was being taken. Effective progress had already been made in some parts of this country. Altogether events were so shaping themselves that it behooves all to take notice of these trade winds and to learn and understand the situation thoroughly that friction and trouble and possible bolshevism may be avoided.

Six Resolutions Adopted

The six resolutions reported by the Resolutions Committee (Messrs. Carroll, Boynton and Carmichael) and adopted were substantially as follows:

REGARDING ORDER NO. 28.

"We demand the modification of the aforesaid order of the Railroad Administration, No. 28 as follows: First: The repeal of the advance made on sand and gravel; Second: The repeal of the application of the rule regarding the disposition of fractions contained in Section 6 of the order."

REGARDING FACTORS IN RATE MAKING

"Resolved that we are opposed to any system of rates which does not recognize and give effect to the following factors:

"1. What the Traffic will bear. 2. Competition with railroads, water transportation, local pits and quarries. 3. The volume of the traffic. 4. The value of the commodity. 5. Probable loss and damage claims. 6. The density of traffic. 7. The season of heaviest shipping. 8. The cost of service. 9. Physical and operating conditions."

National Association of Sand and Gravel Producers

OFFICERS FOR 1919

President:—Harry Donnelly, Cincinnati, O.

Vice-President:—Walter Jahncke, New Orleans.

Treasurer:—George V. Miller, Indianapolis.

Secretary:—E. Guy Sutton, Indianapolis, Ind.

Directors:—John Prince, Kansas City, Mo. (4 years); John S. Porter, Saginaw, Mich. (4 years); Burton H. Atwood, Chicago (2 years); J. E. Carroll, Buffalo (2 years).

REGARDING IMMEDIATE RAILROAD LEGISLATION

"We are in favor of immediate legislation on three propositions as follows: First, Strike out the clause which states that the President's order shall supersede state and Federal laws and the common law. Second, Insert a sentence requiring the railroad administration to pay final judgments rendered against common carriers. Third, Restore the suspension powers of the Interstate Commerce Commission."

REGARDING OPERATION AND CONTROL OF RAILROADS

"We are opposed to the five-year experimental period proposed by the Director-General and the appointment of a Secretary of Transportation as suggested by the railroad executives, and favor a return of the railroads to the owners thereof as soon as it can be accomplished."

REGARDING PUBLIC WORKS IN ILLINOIS

"Whereas, the Public Works Department of the State of Illinois has deferred or contemplates deferring to a later date, the beginning of the construction of the system of permanently paved roads for which the people of the State have voted a bond issue of \$60,000,000;

Assessment Plan Adopted by the Convention

Production	Assessment Rate per ton
First 100,000 tons or less...	1 mill
Next 200,000 tons or less...	½ mill
Next 300,000 tons or less...	⅓ mill
Excess over 600,000 tons...	¼ mill

Production	Assessment
100,000 tons	\$100.
300,000 tons	200.
600,000 tons	300.
1,000,000 tons	400.

"RESOLVED, that we deplore the attitude of the said Department, and urge upon them a reconsideration of the question and commend to their attention the address made this day to this Association by Frank J. Pollay of the Federal Department of Labor."

Traffic Committee Report and Resolution

Guy C. Baker for the traffic committee of the association read its report and resolution which protested against any increase in the freight rates and demanded the immediate reduction of the present rates. It did not commit the association to any system of rate making. This resolution was prepared at the convention by the committee composed of Guy C. Baker, H. D. Conkey, G. V. Miller, E. Guy Sutton and H. E. Earle and J. R. McGaw. The two latter were appointed at the opening session.

Opinion Against Change in Basis of Rates

Attorney John S. Burchmore, an expert on freight rate matters, gave a brief history of shippers' troubles with railroads. In 1870 he said the hit and miss go-as-you-please policy of the railroads was in effect when the public was completely at the mercy of the carriers. Then in order to stop the evils that had grown up the Interstate Commerce Commission was organized and there was some improvement, but conditions gradually became worse again and in 1906 the power and authority of the commission was strengthened. In 1912 the railroads' right to fix rates arbitrarily and with finality was removed. From that time, the carriers have had to ask permission to raise rates.

While he appeared to favor a mileage scale of rates for some commodities he did not seem to think such a scale adaptable to products of the earth like coal, limestone, etc.

F. E. Bentley, traffic manager of the Universal Portland Cement Co. delivered this truism in his talk on rates:

"Railroads are complements of commerce." Commerce comes first, or should come first in consideration, he insisted, because without commerce the railroads would be useless. He opposed a mileage basis of rates; he "believes that railroads are entitled to an increase; but that rate making should be done fairly."

Mr. Bentley assured the convention that this proposed rate schedule was not a sectional matter but the forerunner of a national proposition to put all freight rates on a master mileage scale. Other men spoke strongly against a mileage scale of rates.

Examples of Getting Together

Secretary Sutton announced that arrangements had been made to co-operate with the stone and the slag associations

to present their case at the freight rate hearing on the following day.

A. J. Blair, president of the National Crushed Stone Association, told the story of the get-together organization of the sand, gravel and stone men of Wisconsin known as the Wisconsin Mineral Aggregate Association. After the formation of the War Service Committee on Mineral Aggregates, he said, "we found none of us wore horns, and the experience in that war work satisfied us that we all could do better by co-operation in one organization than in any other way."

J. H. Allen, of Lincoln, Neb., vice-chairman of the Mid-West Association of Mineral Aggregate Producers, said the best thing ever done was the forcing together by Mr. Humphrey of the gravel and stone men. H. G. Earle of Detroit,

gave a rattling good argument for joining trade associations.

Talks on Plant Operations

Allen Foley of the Construction Materials Co., Chicago, spoke briefly on crushing operations in a gravel plant; Geo. V. Miller of the Granite Sand and Gravel Co., Indianapolis, on elevating, and W. P. Carmichael of Williamsport, Ind., on stripping.

R. C. Yeoman, associate professor of highway engineering at Purdue University, read a paper on "The Development of the Gravel Road" near the close of the meeting.

The Treasurer's report showed a balance on hand of \$2524.92. Mr. Sutton stated that the association had spent less than \$4500. The executive committee bore its own expenses, and the Indiana

Association paid a large part of the expenses for national work. The committee's assessment plan on 1918 tonnage was approved. The Nomination committee's nominations were elected unanimously. The revised constitution as submitted by the Executive committee was adopted without change. The principal differences from the old are the inclusion of four members in the Executive committee instead of two; the formation of an advisory council to be known as Regional Advisors and the granting of permission to states to enroll their membership by remitting 75 per cent of the total tonnage assessment made by the national, the state association retaining the other 25 per cent for its own needs.

History of a Memorable Year in the Sand and Gravel Industry*

Great Benefits Reaped in Organization and in Improving the Business Status of the Industry

THE NATIONAL ASSOCIATION

of Sand and Gravel Producers, and the industry which it represents, has passed through a year of varied experiences and activities. Following the congestion of traffic during the winter months of 1917 and 1918 it was early apparent that the railroads were inadequately equipped to move coal in sufficient quantities to supply the demands of war activities and at the same time provide an ample supply of open-top cars for shipment of sand and gravel. In view of this situation, your secretary made three trips to Washington between the months of February and May, accompanied on two occasions by H. C. Huffstetter of the Indiana Association with the special mission of securing a ruling on the use of open-top equipment. As the result of persistent efforts and numerous conferences with officials of the Railroad Administration and the National Highways Counsel, Circular CS-13 was issued about the last of May, on the basis of which most of our producers received a sufficient number of cars to take care of their orders, which of course were greatly reduced on account of war conditions.

In addition to securing the ruling referred to, a working relation was effected with the Car Service Section of the Railroad Administration in consequence of which many complaints were submitted to, and investigated by, that department. The result was that with

By E. Guy Sutton
Secretary, National Association
of Sand and Gravel Producers

few exceptions railroads refusing to furnish cars were instructed to provide at least a limited service. Furthermore, no commodities other than mineral aggregates, not directly essential to war work were given a special car service ruling so the Association may feel justly proud of having an important part in the accomplishment of that result.

Freight Rates Go Up

On May 27 came the sudden announcement of the issuance of General Order No. 28 whereby an increase of 20 cents a ton was applied on sand, gravel and crushed stone freight rates. In view of the fact that most other commodities by the provisions of that order bore an increase of only 25%, while the shippers of sand and gravel were burdened with an advance of from 25 to 150%, no time was lost in protesting against the unjust action.

Your secretary accompanied by J. H. Swango, an attorney of Terre Haute, Ind., who has given a great deal of study to traffic matters, attended a conference at Detroit on June 11, of allied interests that were adversely affected by the order, including contractors and industries en-

gaged in the production of cement, brick, crushed stone, slag, sand and gravel, as well as manufacturers of road-building machinery, trucks and automobiles. Following this meeting Judge Swango and your secretary proceeded to New York and there appeared before the Eastern District Freight Traffic Committee, by which we were referred to the Traffic Division of the Railroad Administration at Washington.

On June 18, or about 15 days after the order had reached the general public, our case was presented before the representatives of the Railroad Administration appointed to hear complaints with reference to the application of the order. While no positive decision was rendered as a result of this hearing, yet every assurance was given that a satisfactory adjustment would be made, but on June 25 the order went into effect without modification.

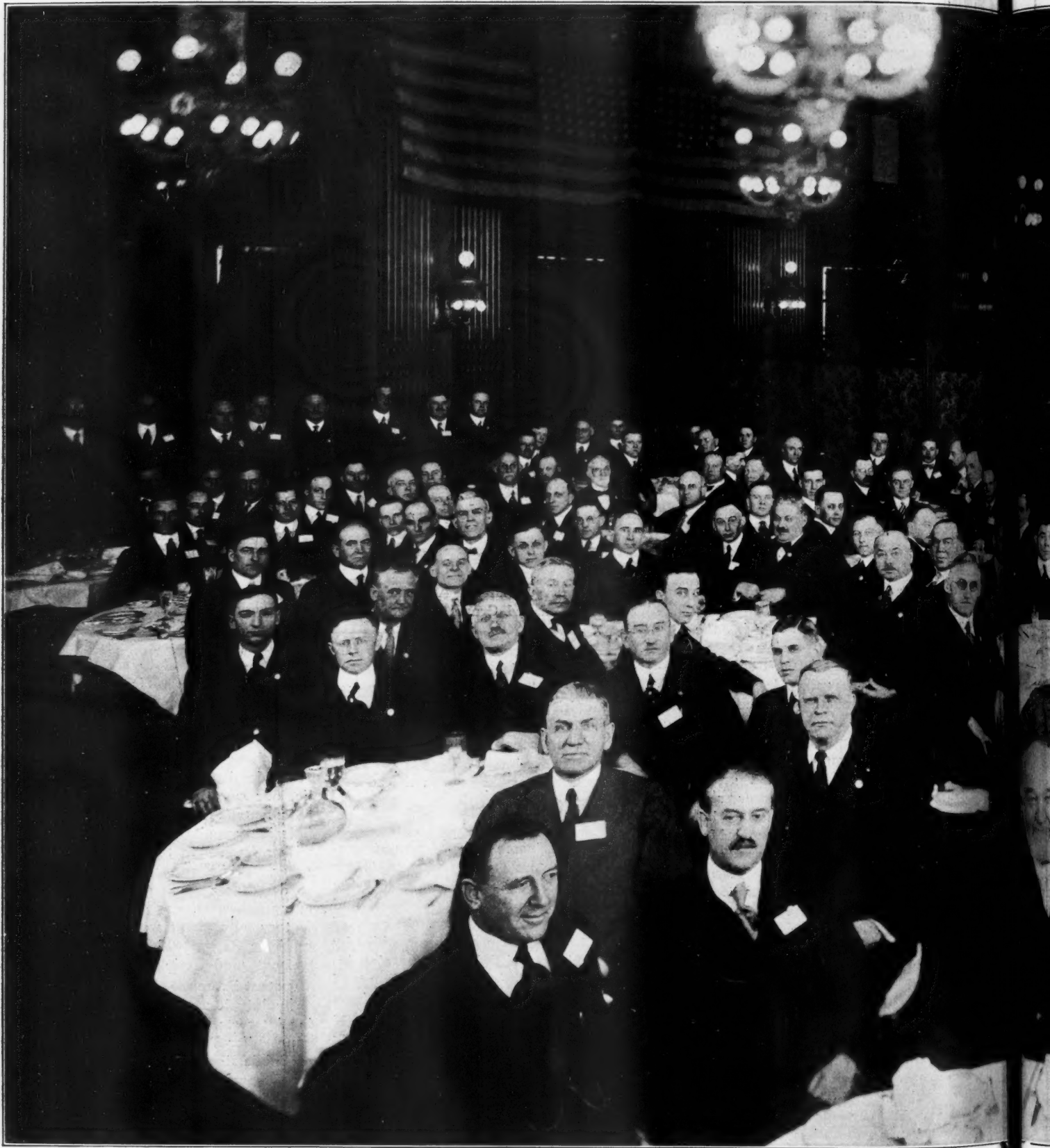
Constant Promises of Relief—No Action

On July 10 a conference of road-building interests was called by the late Logan Waller Page, Director of the Office of Public Roads and Rural Engineering, for the purpose of discussing the subject of high freight rates applying on road-building materials and if possible to devise a course of action for securing relief.

Following this conference the committee composed of all the interests represented presented a petition to the Railroad Administration seeking redress.

*Report as Secretary at the annual convention of the National Association of Sand and Gravel Producers.

Members and Guests of the National Association of Sanitation



Scene in red room of Hotel La Salle, Chicago, the second day of the third annual convention, January 29 and 30, 1919. The room January 30 that the freight rate hearing was conducted. At that time the plan was to hold the hearing in the room from several states, as well as from several other countries.

Sand and Gravel Producers at Luncheon at Chicago Gathering



January 29. Beyond the folding screens is the section where the great meeting was held. It was in this place was crowded with stone, slag and cement men, highway boosters, as well as sand and gravel producers

Again assurances were given of remedial action being taken. Your secretary on numerous occasions following this latter hearing made personal protests to members of the Traffic Department of the Railroad Administration and was encouraged to believe that a correction of the unjust and inequitable application of the order would be made soon. However, contrary to all expectations an adverse decision was given on September 20, and at the same time the matter was referred to the attention of the various District Traffic Committees to whom petitions and protests have been presented but thus far without avail.

Part in Forming War Service Committee

Early in the season your secretary had discussed with the Chamber of Commerce of the United States and members of the National Council of Defense the advisability of forming a War Service Committee representing the industry. Since sand and gravel plants were not adaptable to the manufacture of war material and our shipments were automatically zoned by freight rates, it was thought that no necessity existed for the organization of such a committee. However, as the war progressed, following the formation of the War Industries Board, it was requested by Richard L. Humphrey, Chief of the Building Materials Section, that our industry be organized for war service work in conjunction with producers of crushed stone and slag.

It was originally proposed to perfect the organization on short notice but again Mr. Huffstetter and your secretary proceeded to Washington and induced Mr. Humphrey to give sufficient time for getting a representative attendance of the members of our industry at the organization meeting. Accordingly a call was issued to all producers to assemble at Washington on August 13, the date preceding the meeting with Mr. Humphrey.

Producers from all parts of the United States were present at the preliminary conference which was held at the Washington Hotel, and there great enthusiasm was created for the success of the National Association. Following the organization of the War Service Committee of the combined mineral aggregate industries, it became apparent to the Executive Committee of the National Association that the greatest good to the members of the Association could probably be accomplished by having a representative at Washington and therefore your secretary was permitted to become Executive Secretary of the War Service Committee on Mineral Aggregates; and from that time on the work of the National Association was conducted from Washington.

The War Service Committee was in ac-

NATIONAL ASSOCIATION OF SAND AND GRAVEL PRODUCERS

Table showing percentage of membership by states based on mailing list of the Association and not necessarily on actual number of producers.

	Number of Producers	Per cent who are Members		Number of Producers	Per cent who are Members
Alabama	4	25	New Hampshire ....	..	0
Arkansas	1	100	Nevada .....	..	0
Arizona .....	..	0	New Mexico .....	..	0
California	1	100	New Jersey	18	45
Colorado	6	16	New York	16	25
Connecticut	21	0	North Dakota .....	..	0
Delaware	1	100	North Carolina	2	0
District of Columbia	1	100	Ohio	41	35
Florida	3	0	Oklahoma	9	33
Georgia	22	10	Oregon .....	..	0
Illinois	40	70	Pennsylvania	80	25
Indiana	70*	23	Rhode Island	2	0
Idaho .....	..	0	South Carolina	3	0
Iowa	54	20	South Dakota .....	..	0
Kansas	8	25	Tennessee	13	40
Kentucky	7	45	Texas	13	25
Louisiana	5	60	Utah	1	100
Maine	3	33	Vermont	1	0
Maryland	16	6	Virginia	16	6
Massachusetts	21	10	Washington	1	100
Michigan	26	53	West Virginia	11	10
Minnesota	6	83	Wisconsin	13	40
Mississippi	3	66	Wyoming	2	0
Missouri	21	20			
Montana .....	..	0			
Nebraska	7	70	Total	589	

*Indiana producers claim there are only 56 modern plants, which fact considerably increases the percentage of membership.

tive existence only about two months previous to the signing of the armistice and therefore little more than preparation for contemplated future activities was accomplished, though at the request of the War Industries Board the Committee was not formally disbanded until January 6, 1919.

Cooperation with Stone Producers Fostered

There is one outstanding benefit, however, that has come in consequence of the formation of the War Service Committee and that is the bringing about of a closer relationship between all producers of mineral aggregates. In some districts, these former bitter competitors have united in joint local associations and in further testimony of good faith between these allied industries a committee on cooperation has been appointed from the three National Associations representing the production of stone, slag, sand and gravel, which will unite in giving attention to matters of common interest.

Throughout all the adverse conditions under which we have labored the past year, the advantages to be gained through the activities of a strong National Association have been made manifest and to the extent that there is an insistent demand from producers operating in all parts of the United States for a more formidable organization. In response to this demand, the Executive Committee authorized the revision of the constitution along constructive lines

whereby it is possible to raise sufficient funds for providing facilities for promoting the best interests of the industry and for meeting the conditions of uncertainty that confront us during the period of readjustment. A program of activities for the coming year will be submitted to you during another session of this convention.

The Association has conducted a vigorous campaign throughout the year for increased membership by written appeal, personal solicitation and through the means of local associations. Previous to the opening session of the last annual meeting, the Association had a total membership of 43. Since that time 138 new members have been enrolled making a total membership of 181, or an increase of over 300 per cent (318%).

Two Sand Companies Buy New Gravel Pits

THE Standard Builders' Supply Co. of Grand Rapids, Mich., has bought a gravel pit, along Grand river, of 50 acres, having a depth of 100 feet, says the Grand Rapids Herald.

Early in the spring it will begin working the pit and will run a boat to Grand Haven in connection with its output. This company owns two pits in Grand Rapids, which it has operated for some years.

J. K. Davison & Bro. has purchased "Twelve Mile Island" in the Allegheny river, says the Sharpsburg (Pa.) Herald for \$34,500. The island contains 76 acres.

Cement Industry of the Lehigh District

Part Two—Resumé of the Commercial and Mechanical Development of the Premier Rock Products Industry—Progress in Quantity Production

IT MAY BE WELL at this stage to consider in detail each department of the mill in the modern cement factory and see just what improvements have been made, and how the manufacture of Portland Cement has become a highly specialized business, utilizing in the most efficient manner the best and most modern types of cement mill machinery.

Operation

The methods employed by the various cement companies during the early period of the development of the industry were crude indeed. Steam shovels were rarely if ever employed and quarrying operations were carried on mostly by man and animal power. Quarry cars were almost exclusively loaded by hand and the pieces of stone quarried were necessarily not larger than the average man could handle.

The tripod steam or air drill was generally employed, and the blasting of rock was done on a comparatively small scale.

With the use of the steam shovel larger equipment was therefore necessary and the demand consequently arose for larger crushers; we then have in place of the small gyratory and toggle crushers, the mammoth size gyratory crushers and crushing rolls. The stone is quarried of such size that it would be impractical and expensive to load by hand. By this means the cost of quarrying entering into the cost for manufacturing a barrel of cement has been greatly reduced.

The tripod drill is rarely employed except in a very limited capacity, the principal drilling is accomplished by means of the deep well drill, the tripod and jack hammer drills playing only a minor part in breaking down embankments otherwise inaccessible to the larger drill, and also in shattering the very large pieces of stone, too great in size to be handled with the steam shovel.

Mechanical or electrical motive power is used exclusively to propel the quarry cars and one no longer observes the cars being shoved about the quarry by means of man or beast. In the early days of the industry more men were employed in the quarry than in all other parts of plant combined; today quarrying operations are carried on on a large scale and the item of labor expense has been reduced to a minimum.

Crushing Department

The gyratory crusher is still in use and seems destined to occupy a principal

By S. H. Harrison and
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Consulting Engineers, Easton, Pa.

place in the modern cement plant. In place of the No. 3 and No. 5 crusher, sizes hitherto unthought of are now employed, crushers of the large size taking stone handled by the largest steam shovels without preliminary reduction. Another type of crushing machine which has gained considerable favor during recent years is the large single roll type crusher, such as the Fairmont made by the Allis-Chalmers Co. Although the principle on which this machine is designed is not new, it is of very rugged construction, extremely powerful in operation and has enormous capacity. Naturally in handling such large quantities of rock, conveying and elevating apparatus of large capacity are employed. Most of this apparatus operates at a slow speed, and is of heavy construction.

Drying Department

Most of the cement plants in the Lehigh district dry their raw material in rotary dryers fired in the usual way either by means of stokers or by hand. Several plants have utilized the waste heat from their kilns to dry the stone, outside of this fact very little improvement has been made in stone-drying machinery, the dryers being substantially the same, only of considerably larger dimensions, than those formerly used.

Edison attempted to dry stone in a stationary dryer of the cascade type, the downward passage of stone coming in contact with the upward current of hot gases. The success of this type of dryer is questionable and after a lapse of twenty-five years in the portland cement industry, the rotary dryer is still in use in all cement plants throughout the United States. If new improvements in this department are to be made they may be looked for along the lines of waste heat utilization and not upon the introduction of a new mechanical principle.

Pulverization of Raw Materials

Considerable progress has been made in the design of machinery for the pulverization of raw material. Machines of larger size and consequently increased capacity seem to be the tendency of the times and manufacturers are vying with each other to turn out mills of greater

and greater capacity, as for instance, the "Hercules" mill of the Bradley Pulverizer Co., the "Dreadnaught" mill of the Lehigh Car Wheel & Axle Works, the "Compeb" mill of the Allis-Chalmers Manufacturing Co., the "Duplex Ring-Roll" mill of the Sturtevant Mill Co., and many others.

Another type of mill which seems to be gaining favor with cement plant managers, is the high-speed swing-hammer mill. This mill is generally used as a preliminary grinder for raw materials and coal. It occupies comparatively little floor space, the repairs are light, and the output large considering the horse power necessary to drive the machines. Mills of this type are made by the Williams Patent Pulverizer Co., the Jeffrey Manufacturing Co., the Sturtevant Mill Co., the Allis-Chalmers Manufacturing Co. and others. The separation of the fine particles from the coarse by means of air has been tried out with more or less success; most of the mills having discontinued its use.

In quite a number of plants tube mills are employed for the final reductions of the stone. As a tube mill is a rather difficult apparatus to drive in that it is hard to start due to the load being unbalanced, a great deal of time and effort has been expended by the different manufacturers in obtaining a compact and at the same time an efficient drive. Friction-clutch belt drives were formerly employed and proved to be costly, due to the frequent breakages of clutch parts. An attempt was made to drive mills of this type by gearing them direct through a clutch gear from the line shaft. This method proved to be impractical and very expensive.

The latest and best method seems to be individual electrical drives, the motors being either poly-phase induction motors of the squirrel cage type, having high resistance end ring rotors, capable of developing a very high starting torque; motors having wound rotors are also employed; this latter type of apparatus seems to be especially fitted for driving loads such as tube mills, ball mills and kilns.

Another successful method employed for driving machinery of this type is by means of high speed chains of special design, such as the silent chain as made by the Link-Belt Engineering Co. The motors are placed at comparatively short

centers from the mill, the chain runs in oil, and the drive is compact, efficient and little floor space is taken up, which is usually not the case in driving tube mills.

Kilns

American practice at the beginning naturally followed the European works and the first kilns installed were of the dome or bottle shape and intermittent in action. The raw material was moulded into bricks or blocks and placed in the kilns through doors at regulation heights and covered with alternate layers of coal and coke. The kiln was then lighted at the bottom and allowed to burn out. This process released the carbonic acid gas and the bricks would run together, though the mass was not uniformly calcined and required too much sorting. Much of the clinker was under-burned, while considerable would be over-burned; furthermore, too much waste heat went up the stacks, so that the operation was costly and had to be abandoned.

The old style dome kiln was followed by the introduction of the continuous kiln of the Dietzsh & Schoeffer types. These two kilns, as well as the Hauen-schild, were fed from time to time in regular charges, and the bricks of raw material were carried through the drying chambers to the top of the kiln. The required amount of coal was fed at the same time, hence the operation was continuous. These kilns had also been successfully used in Europe and showed considerable economy in coal consump-

tion, though, as was the case with the dome kiln, too much labor was required in handling the materials. Eventually the works using this form of kiln, in order to meet the competition of their neighbors, discarded them and installed the more economical rotary kiln.

The rotary kiln installed in the early days of the industry was diminutive in size when compared to the kiln of today. In the kiln department, perhaps more than in any other department of the cement factory, has progress been made, not only in the large amount of material which is daily passed through the kiln but in the very substantial decrease in fuel consumed per barrel of cement burned.

Ever since Edison pointed out the advantages to be gained in the use of the long kiln, cement manufacturers have been substituting the long kiln, i. e., the kiln over one hundred feet in length for the short kiln. The majority of the kilns in the Lehigh district before Mr. Edison built his long kilns were only 60 feet in length, but kilns of greater length, 80 ft. or more, were in use in the Central West and there was at the time a gradual but slow evolution in kiln design taking place, when Mr. Edison boldly introduced the modern long kiln, thus accelerating the rate of development of kiln practice.

It was formerly current practice to drive all the kilns in the mill at a predetermined constant speed; this was done by driving the kilns by means of a sprocket wheel and chain drive through

clutches from a main line shaft. In some cases each kiln was driven by means of a separate steam engine, and although the method would be considered crude today, nevertheless it led to the practice of individual kiln drives and variable speed operation. Today all modern kilns are electrically driven by variable speed motors, either direct current, or alternating current machines being employed. The direct current motor for this purpose seems to be the more popular.

Introduction of Powdered Coal Fuel

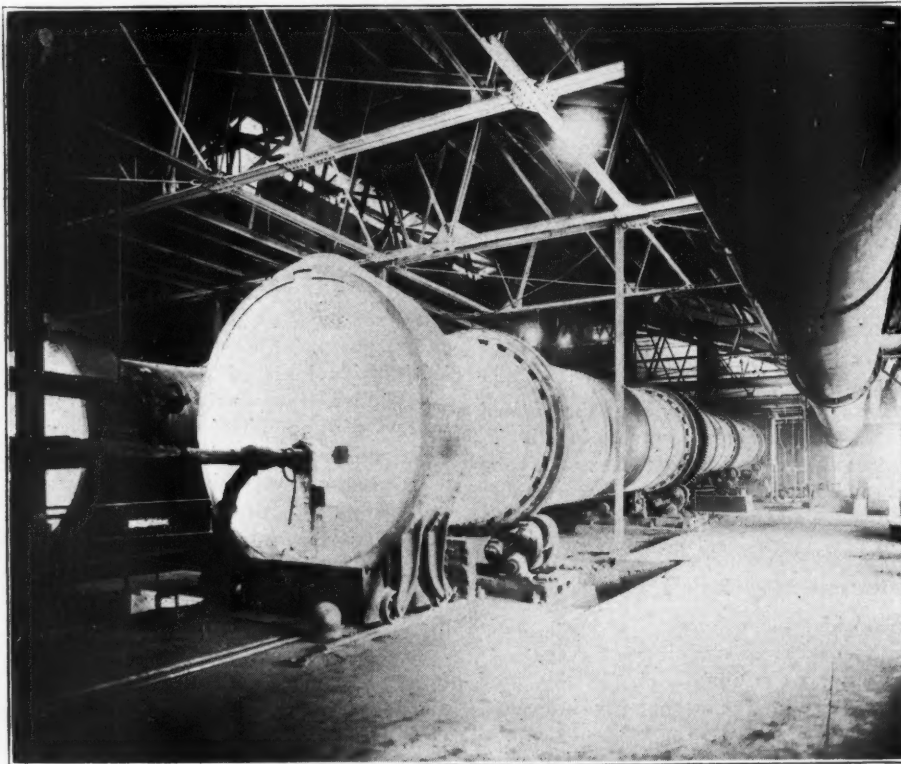
At first fuel oil was used for firing the rotaries, but with the gradual increase in cost of this material Lehigh cement manufacturers were compelled to substitute a cheaper fuel for the crude oil. It required approximately twelve gallons of oil to burn a barrel of cement in a rotary kiln 40 ft. in length, and although the price as late as 1898 was about two cents per gallon, it gradually rose to about five cents per gallon, making the cost of fuel alone sixty cents per barrel. It was about this time that the substitution of pulverized coal for fuel oil took place.

With the introduction of powdered coal a number of burners for atomizing and burning this class of fuel, were put forward, all more or less efficient in operation.

Since high pressure compressed air was used for spraying the oil in the kilns, the earlier coal burners employed compressed air also. Today few, if any, high pressure coal burners are used, all being operated by means of air pressure of less than nine ounces per square inch. A notable burner of late years and that patented by Wm. R. Dunn, manager of the Vulcanite Portland Cement Co., is used to a considerable extent; and it is, we believe, the first burner introduced in a cement plant to use pre-heated air. Among the early patents for pulverized coal burning apparatus were those of Hurry and Seamans of the Atlas Portland Cement Co. These patents formed the basis of a number of long drawn out law suits, but happily this trouble has been adjusted and each mill has adopted its own particular burner.

Clinker Handling and Cooling

The cooling of the clinker was generally accomplished by storing it in large vertical coolers, allowing the hot clinker to pass downward over a series of ring shaped baffled plates inclined at an angle of 45 deg. The falling clinker coming in contact with a current of cold air, which was blown upward from a central air chamber, cooled the clinker to some extent. But this method was costly in that it required considerable power to operate the high-speed fans of large volume.



Modern rotary kiln equipped with Dunn pulverized coal burner

To offset this great expense, the revolving cooler was introduced. This apparatus, which is similar in construction to the rotary dryer, receives the hot clinker as it issues from the kiln, discharging same after it has passed over longitudinal baffles. The cylinder is inclined to the horizontal at a pitch of about $\frac{5}{8}$ in. to the foot. The air supplied to the cooler is by means of natural draft, as each cooler is furnished with a rear housing of masonry which supports a stack of suitable size.

It may not be out of place to mention here, that this principle of rotary cooling was first introduced by the Atlas Portland Cement Co., and constituted a part of their cement burning equipment as installed in their plant at Northampton, Penna.

Another method for cooling clinker in use at some of the plants is to store the hot clinker in the open, exposing it to the weather, and when is it sufficiently cool, removing it by means of a travelling crane. This is, perhaps, the most satisfactory method so far employed.

Clinker Grinding Department

In clinker grinding, as with the machinery used in the raw grinding department, the tendency has been to install units of large capacity. In some instances the cement is first ground in preliminary grinders such as the ball mill, or the Griffin mill and then finished in large tube mills using "slugs" or "cylpebs" to facilitate the fine grinding.

As the tendency of the times has been to produce a finely ground cement, considerable attention has been given to this subject. But cement manufacturers in general do not seem to be in favor of carrying this requirement too far, as it greatly diminishes the output of their mills. The cost of grinding mounts higher and higher as the fineness of the output is increased.

Fuel Grinding Department

The remarks which have been made in reference to the machinery in the other departments is also applicable to this department, viz: increased size and capacity.

When powdered coal was first introduced as a fuel for burning in the rotaries, frequent accidents were caused due to the explosive nature of this material when mixed with air, but with its increased use and the long experience of the men employed, accidents now rarely occur, and it seems to be one of the safest fuels to use, if the proper care is exercised, and the fuel mill kept in a clean condition.

Packing Department

In no department of a cement plant has greater improvement been made



Old style upright clinker coolers

than in the packing department. It was the custom in the early days of the industry to pack by hand, and in nearly all the mills in the Lehigh district, cement was packed in bags from an overhead bin; the cement being led to the bags through long chutes. It was quite common in some mills to see cement being packed by shoveling it directly into the bags and barrels from the bin floor. Lately automatic packers have been introduced greatly eliminating labor and increasing the packing capacity of the plant of former years. Such systems have been perfected by the Modern Bag Co., and the Bates Co., both of which automatically weigh the material rapidly and accurately.

In the early period of manufacture the wooden barrel was the sole package in which portland cement was shipped, due primarily to the fact that natural cement made along the lines of the great canals, was always shipped in wood, being the logical package for water transportation. Again, foreign portlands which held the market exclusively, always appeared in wooden containers, so that it was a long time before the American manufacturers could induce their customers to accept the product in cotton or paper bags.

Today practically the only cement packed in barrels is for export or water shipment; however, as the foreign trade is considerable with some of the Lehigh companies, it is well to note the improvement in the wooden package and in the making of same.

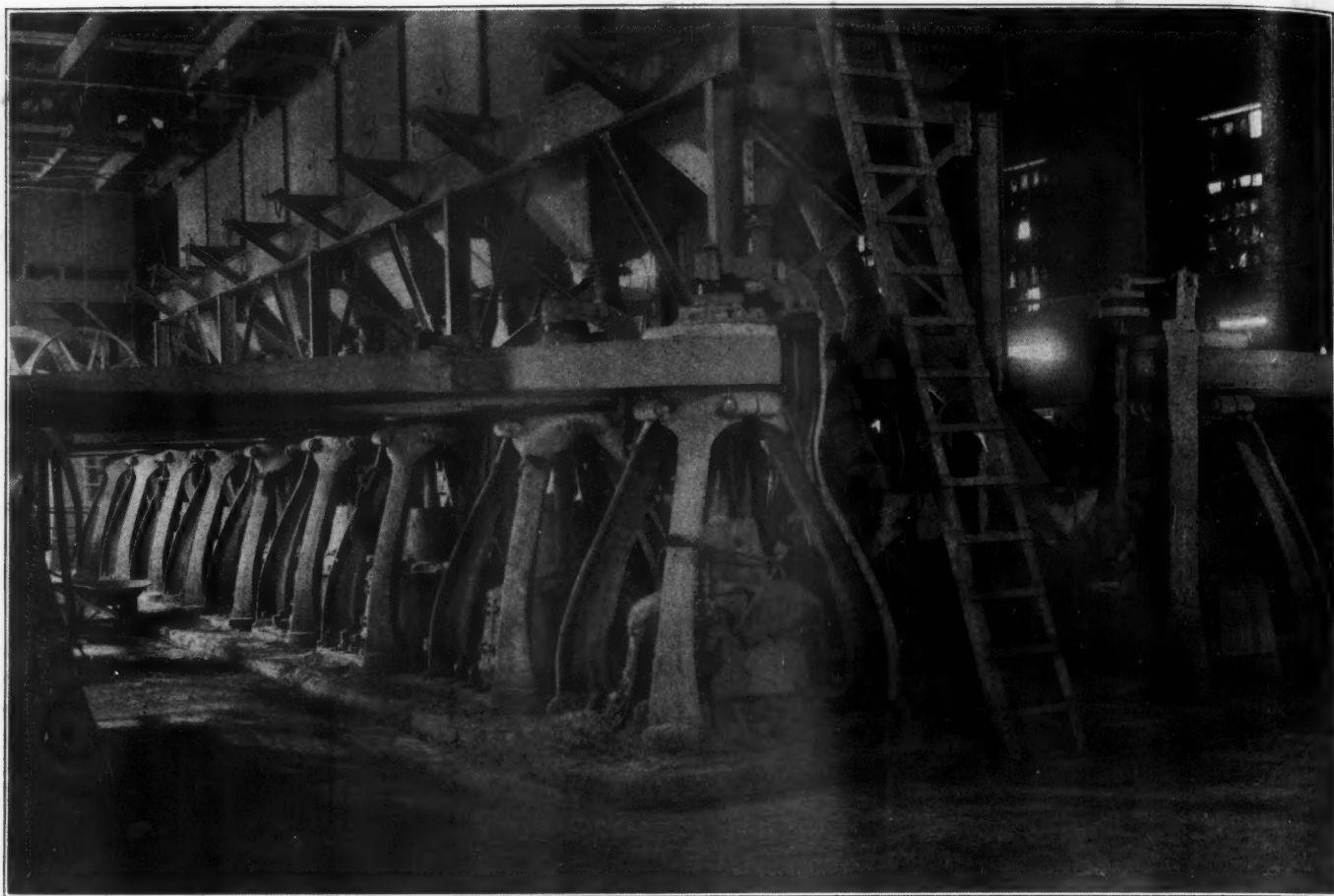
For many years there was no barrel

machinery in the various cement mill cooper shops—all barrels were turned out by hand and half round chestnut hoops were used exclusively; this made a costly and inferior package to the barrel made today by machinery, using patent wooden or iron hoops, as is attested by fewer complaints of broken packages. Furthermore, the output per day for the men employed in the cooper shop soon compensates for the barrel making equipment.

Recovery of Waste Heat

This problem has occupied the attention of cement manufacturers for years and has been tried in the past with more or less success in the generation of steam for power purposes. However, it was only during recent years that an installation has been perfected which has given satisfactory results. This consists chiefly in so designing the flues and gas passages leading to the boiler that the deposits of fine dust are readily removed. Waste heat installations have been put in mostly in connection with the Cottrell electrical precipitating process for the recovery of potash from the waste gases from the rotary kilns.

The utilization of waste heat for the operation of stone dryers has been mentioned in the early part of this article. Perhaps no greater economy since the foundation of the industry, has been effected than the utilization of waste heat for the generation of power. It is along this line of development that all modern cement plants must turn if they want



Battery of Griffin mills in a Lehigh district cement mill

to successfully compete with their business rivals.

Conclusions

We have endeavored to show in detail how the portland cement industry of the Lehigh district has grown, starting from a meagre production of a few thousand barrels per year during the seventies,

and reaching 27,000,000 barrels in the year 1913. This phenomenal growth has been due to the keen foresight and business acumen of the men engaged in this industry and they may justly feel proud of the position to which they have advanced this important branch of manufacture, from one of comparatively little

value, to one occupying the front rank of the principal industries of the Lehigh Valley Section.

Little did Saylor think upon completion of his experiments at Coplay, that he was establishing an industry, which in less than half a century would grow to such enormous proportions.

U. S. Department of Labor Says Railway Freight Rates on Building Material Will Not Be Increased

WORD COMES from Washington on February 10, that the public works and construction development division of the United States Department of Labor has received assurance from the Railroad Administration that "rumored" increases on sand, gravel, crushed stone and slag will not be allowed. Thus the good effect of the Chicago "hearing" is already being felt.

However, let it be remembered that the Railroad Administration officials have all the time taken the stand that the proposed rates were

"revisions" and not increases, and that they even had the hardihood to attempt to prove so at the Chicago hearing.

The announcement of the Railroad Administration through the Department of Labor can be accepted only as a disclaimer of being the "daddy" of the proposed rate schedule. Moreover, don't let it be forgotten that many of the present freight rates are higher than all reason and if continued will obstruct highway improvement this season.

Lime Production in 1918 One-Fourth Less Than Pre-War Maximum

For the First Time in History of the Industry Building Lime Production Is Less Than That of Chemical Lime—Government Restrictions and High Prices Curtail Output of Agricultural Lime

ABOUT 3,028,000 short tons of lime was made and sold in 1918 in the United States, including Porto Rico and Hawaii, the lowest recorded production since 1908 and a decrease of 20 per cent from that of 1917, which was 3,786,364 short tons and which represented a decrease of 7 per cent from the record output, that of 1916 (4,073,433 short tons). The estimate of the output in 1918 is based on returns made by the principal producers to G. F. Loughlin, of the United States Geological Survey, Department of the Interior. Of the 41 producing States and Territories only South Dakota, New Mexico—both very small producers—and Tennessee, reported increased sales. The increase in Tennessee—17 per cent—is in striking contrast to the decrease in all other States that reported considerable production. The percentage of decrease varied within wide limits; Michigan lost only 2 per cent and Indiana 3 per cent, whereas California lost 37 per cent, Wisconsin 38 per cent, and West Virginia 45 per cent. Even greater decreases were reported from some of the States that made only small production; Florida lost 54 per cent, Oregon 55 per cent, Idaho 76 per cent, and Rhode Island 96 per cent. All producers reported that prices in 1918 were 10 to 35 per cent higher than in 1917, and the total value may, therefore, not show marked change.

The adjoining table shows the estimated output of all States that marketed more than 30,000 tons of lime in 1918. All these States produced more than 50,000 tons in 1917.

Hydrated Lime

The sales of hydrated lime in 1918 amounted to about 627,000 short tons, a decrease of 11 per cent from the quantity reported in 1917 (709,757 short tons), which in turn was a decrease of 1.6 per cent from the record production of 1916 (717,382 short tons.) Of the principal producing States eight showed increases in sales ranging from 2 per cent in Maryland and 52 per cent in Virginia. The output of ordinary quicklime, including some dead-burned high-magnesium lime for refractories, decreased nearly 22 per cent, from 3,072,207 short tons in 1917 to 2,401,000 short tons in 1918, a decline

which indicates that in spite of the adverse conditions hydrated lime held its position far better than quicklime.

Building Lime

War restrictions on the building trades greatly reduced the demand for building lime, the production of which in 1917 amounted to one-third of the total lime output. Manufacturers of building lime, except those who supplied Government contractors, reported decreases in demand ranging from 5 to 90 per cent in 1918, and some plants that supply only building lime were closed throughout the year. A number of Government building projects, most of them in the East, had called for or were likely to call for lime during the last two months of the year, but some of these projects may have been abandoned after the armistice was signed on November 11. All restrictions placed by the War Industries Board on the production and transportation of lime were removed on November 12, too late to have any appreciable effect on the recovery of the industry before the end of the year. In view of these conditions it will not be surprising if the revised and itemized figures show that the building lime sold in 1918 has fallen to about 900,000 short tons and that building lime has for the first time lost to chemical lime its lead among the lime products.

The general curtailment of building operations since the spring of 1917, however, implies that greatly increased activity is necessary to restore the country to normal conditions in this respect, and the Federal Government is already taking steps to stimulate building. Doubtless many prospective builders are inclined to wait for a decrease in costs, but although the cost of some necessary commodities and of labor may decrease slightly, the great demand for buildings will probably maintain the prices of building materials in general at a high level.

Chemical Lime

Sales of chemical lime, stimulated since 1914 by war needs, continued to increase. Most manufacturers reported the demand to be from 2 to 70 per cent greater than in 1917, and only a few reported a decreased demand. The output was curtailed, however, by shortage of labor, fuel, and transportation facilities. From 1908 to the early part of 1914 the sales of chemical lime had been increasing steadily and on the whole uniformly. This normal rate, however, was much more gradual than the rate from 1914 to 1918, and the return to normal conditions in 1919 may therefore be accompanied by decreased sales of chemical lime. Continuation of the normal rate of increase would indicate sales of less than 700,000 tons in 1919.

Agricultural Lime

Producers of agricultural lime were about equally divided in reporting the demand as good, poor, or practically unchanged. In some regions the good demand could not be supplied, owing to shortage of labor and fuel. High cost of production caused many kilns that are operated on a small scale for local farm use to be closed. The high prices prevailing for all kinds of lime probably reacted more against agricultural lime than against any other kind, especially in curtailing purchases by farmers with small capital. Government restrictions also tended to discourage production. Early in 1918 there was great difficulty in obtaining cars, but in March the Railroad Administration agreed to give agricultural lime and pulverized limestone preferred classification

ESTIMATED PRODUCTION OF LIME IN THE UNITED STATES IN 1918

	Total lime	Hydrated lime
	Quantity (short tons).	Quantity (short tons).
	1917.	1917.
Pennsylvania ..	800,000	145,000
Ohio	350,570	225,750
Virginia	255,880	11,310
Missouri	199,850	32,250
West Virginia..	134,270	41,350
Michigan	133,410	(a)
Tennessee	118,800	16,970
Massachusetts ..	117,840	(a)
Indiana	115,300	24,490
Maryland	113,110	27,610
Wisconsin	105,260	18,200
New York	93,470	8,880
Maine	88,670	(a)
Illinois	64,670	(a)
Connecticut	(a)	(a)
Alabama	49,730	6,430
California	48,930	3,230
Texas	44,710	15,480
Vermont	31,820	(a)
Undistributed ..	161,600	50,000

Approximate total 3,028,000 627,000
a Included in "Undistributed."
b Sales not disclosed in 1917.

for 60 days. On August 1 an order was issued by the War Industries Board requiring farmers to procure a certificate if they required more than 1 ton (enough for 2 acres) of agricultural lime a year. They were relieved of this restriction, however, on October 19, when the State experiment stations were delegated to supervise the distribution of lime. All restrictions were removed on November 12. The quantity of agricultural lime sold annually has been declining at an increasing rate since 1914, and the sales of pulverized limestone, with which it competes, have also declined since 1916. There is a growing conviction, however, that lime in one of these forms is essential to agriculture, and an increase in sales of both products is to be expected in 1919. The degree of increase will depend on the degree of relief from shortage of fuel and particularly of labor.

Other Lime

The demand for lime by other than the building, chemical, and agricultural industries was reported by 13 producers as poorer than in 1917, by 9 as about the same, and by 4 as better. Decreased demand by paper mills and sugar factories and greater demand by steel mills were noted. The quantity sold annually to paper mills, after increasing slightly from 1909 to 1912, decreased markedly until 1915. In 1916, owing probably to a greater demand for domestic wood pulp, sales of lime to paper mills increased rapidly and reached record figures, which were exceeded by a small margin in 1917. In 1918, however, the paper industry was impeded by a shortage of necessary supplies, which evidently accounts for the decreased demand for lime. The demand in 1919 by the paper industry may be favored by relief from the war shortage of materials, but it may be lessened by restoration of imports of wood pulp to a pre-war basis. These conflicting conditions and the varying demand prior to 1916 render a forecast of the demand in 1919 of little value.

Sales of lime and of limestone to sugar factories have fluctuated annually since 1910, and a decrease in 1918 after an increase in 1917 adheres to this rule, which, however, is no indication of the status of the sugar industry, but rather an indication that sugar companies, particularly in California, lay in a surplus of lime or limestone on an average every other year. The high prices prevailing in 1918 would naturally have discouraged the maintenance of a surplus, and continued high prices may result in the purchase of only the quantity immediately needed in 1919.

Conditions in Commercial Districts

In previous reports brief reviews of the lime situation have been made ac-

cording to ordinarily recognized State groups, such as New England and the Pacific Coast States. In this report the reviews are presented according to the commercial districts established in 1918 by the Lime Association, which represents a great majority of the lime producers, and the War Service Committee on Lime. The boundaries of these commercial districts agree closely with those of the groups formerly considered, and the few differences will be explained in the following paragraphs.

ESTIMATED PRODUCTION OF LIME IN 1918, BY DISTRICTS

District	Quicklime	Hydrated	Total, 1918	Total, 1917
1	277,450	36,910	314,360	394,589
2	70,410	(a)	70,410	85,872
3	551,640	152,610	704,250	816,929
4	284,920	61,350	346,270	502,838
5b	244,570	11,310	255,880	307,195
6	124,820	225,750	350,570	479,856
7	133,410	(a)	133,410	135,920
8	323,080	c56,740	379,820	436,875
9	115,320	c18,200	133,520	206,859
10	102,330	16,970	119,300	102,559
11d	43,300	6,430	49,730	66,744
12	15,700	.....	15,700	27,082
13e	29,230	15,480	44,710	52,742
14	81,810	10,890	92,700	144,976
Undistributed	17,250	.....	17,250	25,328

Approximate total...2,401,000 627,000 3,028,000 3,786,364
 a Included with quicklime.
 b Virginia only; North Carolina included in "Undistributed."
 c Hydrated for Illinois and South Dakota included in quicklime.
 d Alabama only; Florida included in "Undistributed."
 e Texas only; New Mexico included in "Undistributed."

First District

The output of district No. 1, including the New England States and the narrow area east of Hudson River in New York, was estimated at 314,360 short tons, of which 36,910 tons were hydrated lime. These figures represent a decrease of 20 per cent in the total sales of the district, a gain of 6.7 per cent for hydrated lime, and a decrease of more than 23 per cent for quicklime. All producers reported increases in prices—some as great as 50 per cent—and greatly increased costs of production. Two producers reported the demand for building lime to be the same as in 1917, but all other producers report a greatly reduced demand—from 45 to 65 per cent less than in 1917—in fact, three producers reported no sales at all for this purpose in 1918. The demand for chemical lime increased from 20 to 70 per cent and in large part made up for the decrease in building lime. One company, however, reported the demand as only fair, and another reported it as 25 per cent less than in 1917. A large proportion of the chemical lime sold in this district is used in the manufacture of paper, and the demand for this use was reported as somewhat decreased in 1918. The demand for lime for agriculture was more varied. In Maine it was reported better, the same, and not as good as in 1917; in Massachusetts and Connecticut

the demand as reported ranged from 20 per cent less to 500 per cent more than in 1917; in Vermont and New York it was about the same as in 1917. There appeared to be no demand for lime for any other purposes than those mentioned. Scarcity and cost of fuel, Government restrictions, and lack of labor were reported.

Second District

The second district includes all of New York west of Hudson River. The output of the recently built plant of the Kelley Island Lime & Transport Co., at Buffalo, N. Y., which burns stone brought from the Ohio quarries of this company, is credited to this district. The total output of lime in this district in 1918 was 70,410 short tons, or 15,462 tons (18 per cent) less than in 1917. The output of hydrated lime decreased 43 per cent. At Niagara Falls a considerable amount of lime is manufactured from stone quarries in Michigan, but as this stone is purchased by the manufacturer and reported by the quarry company, it is recorded in the Survey's report on stone. The lime burned by the Solvay Process Co. for the manufacture of alkali is also not included. Conditions in the building-lime trade were reported as poor. The demand for chemical lime was good, and that for agricultural lime the same or better than in 1917. Two of the plants operating in 1917 were closed in 1918.

Third District

The estimated output of the third district, which includes eastern Pennsylvania, New Jersey, and Maryland, amounted to 704,250 short tons, of which 551,640 tons was quicklime and 152,610 tons hydrated lime, a decrease in the total of about 13 per cent and in quicklime of 18 per cent, but an increase for hydrated lime of about 4 per cent. Eastern Pennsylvania produced 125,000 tons of hydrated lime, and Maryland 27,610 tons, both showing increase over the output in 1917. This district was first in rank of production. Prices in all parts of this district were reported as ranging from 20 to 50 per cent higher than in 1917, and cost of operation as 42 per cent higher. In Pennsylvania the demand for building lime was reported generally as very poor, being 25 to 50 per cent below that of 1917, on account of war conditions. In one region, however, the demand was 5 per cent above that of 1917, and at two different plants in Maryland it was reported as good. Demand for chemical lime in both States was reported by most producers to be from 21 to 50 per cent greater, although a decrease in demand was noted in places. The demand for agricultural lime, which is one of the principal lime products of this district, appeared to be

very good in spite of high prices, although in some places it could not be met, owing to shortage of labor, fuel, and cars and to freight embargoes. Decreased demand was also reported by some producers, and several comparatively large plants, as well as many small kilns operated for local use, were closed throughout the year. The demand for lime for other purposes, including dead-burned lime for refractory use, was reported as about the same as in 1917.

Fourth District

The sales of lime in 1918 in the fourth district, comprising western Pennsylvania and West Virginia, were estimated at 346,270 short tons, a decrease of 30 per cent from the sales in 1917. A small part of the decrease was accounted for by the war restrictions on the building trades, but the demand for chemical and agricultural lime was good. Lack of labor, felt more in this district than in any other, high freight rates, embargoes, and high prices to meet increased cost were the main causes of the curtailed output. The hydrated lime produced amounted to 61,350 tons, a decrease of over 18 per cent. The total estimated output of lime in West Virginia decreased 45 per cent; that of western Pennsylvania decreased only 17 per cent.

Fifth District

The estimated production of lime in the fifth district, which includes Virginia, North Carolina, and South Carolina, amounted to over 260,000 tons, which was about 15 per cent less than in 1917. The production of hydrated lime, which comes entirely from Virginia, was estimated at 11,310 tons, an increase of 52 per cent, although the total output of lime in Virginia, 255,880 tons, showed a decrease of 18 per cent. Only one company operated in North Carolina, and none in South Carolina. The demand for building lime was reported as 25 to 75 per cent less than in 1917. Chemical lime for Government contracts was in good demand, and any decrease in output was due to lack of labor. Decreased sales of agricultural lime were reported by one to two producers, although the general demand was fairly good; but lack of fuel and labor was felt by all producers.

Sixth District

The estimated production of lime in Ohio, which constitutes the sixth lime district, amounted in 1918 to 350,570 short tons, 27 per cent less than the production in 1917. Hydrated lime, the estimated output of which was 225,750 short tons, decreased 29 per cent, and quicklime, estimated at 124,820 tons, decreased about 23 per cent. As building lime, which constitutes about two-thirds of the Ohio lime production, suffered the

most under the war restrictions, the considerable decrease in the total output of the State needs little comment. The producers reported small demand for this product except for Government work, and the demand fell off 30 to 80 per cent. The demand for chemical lime was about the same or slightly better than in 1917. Some of the producers of agricultural lime reported poor demand, but several reported better conditions of trade than in 1917. The figures for this district do not include limestone sold for burning to lime manufacturers in other States.

Seventh District

The estimated quantity of lime burned in 1918 in the seventh district, the State of Michigan, was 133,410 short tons, which was but 2 per cent less than in 1917. The demand for building lime in this district was practically negligible in 1918, the output consisting almost entirely of chemical lime, of which a large part is used in the manufacture of calcium carbide. Limestone from Presque Isle County, Mich., is shipped to Buffalo, N. Y., and manufactured into lime near that place, but this production is not included in the output of Michigan. Hydrated lime is made by two operators in this State, and the estimated production for 1918 was practically the same as for 1917.

Eighth District

The eighth district, which comprises Illinois, Indiana, and Missouri, was the second district in rank of production. The output as estimated for 1918 was 379,820 short tons, a decrease of 13 per cent. The estimated output of hydrated lime was over 64,000 short tons, or more than 4 per cent less than in 1917, and that of quicklime was nearly 323,080 tons, a decrease of about 13 per cent. Missouri's production, which represents over 50 per cent of this district's total, was estimated at 199,850 short tons, a decrease of 15 per cent. There was a slight increase in this State for hydrated lime, but quicklime showed a decrease of 17 per cent. The estimated production of hydrated lime in Indiana in 1918 showed an increase of 12 per cent, but the total output of lime for the State decreased 3 per cent. Illinois over one-half of whose output of lime is used for building, showed a decrease of 22 per cent in total production and of 30 per cent in hydrated lime. Throughout this district the demand for building lime was reported as very poor, one producer putting it at 75 per cent less than in 1917, although three companies reported it the same as in 1917. Chemical lime (including lime for paper mills) was reported as in better demand than in 1917, except by two companies, whose

sales were about the same as in the previous year. The demand for lime for steel plants was reported as good, and little change was noted in the demand for lime for other uses. At Logansport, Ind., a lime plant was put into operation by the Logansport Lime & Stone Co. and at Salem the Louisville Lime & Cement Co. was succeeded by the Hoosier Lime Co. In Missouri the Bluff City Lime & Cement Co. started operations at the quarry of the Star Lime Co. at Hannibal, which had not been in operation for some time. Several plants in the district were idle in 1918. One plant in Illinois that was idle in 1917 resumed operations.

Ninth District

District No. 9, including Iowa, Minnesota, Montana, South Dakota, and Wisconsin, decreased 35 per cent in output, from 206,859 tons in 1917 to about 133,520 tons in 1918. Wisconsin's output represented over 78 per cent of the total, and as this State furnishes building lime almost entirely, the greater part of the decrease in the district is accounted for by the war restrictions upon sales of building material. Minnesota's output is also sold principally for use in building. In Wisconsin the demand for building lime was reported as less by 15 to 80 per cent than in 1917. In Minnesota and Montana the demand was reported as 50 per cent less, and in South Dakota this trade was very slack. In Iowa, however, the demand was reported as greater than in 1917. Although comparatively little chemical lime is usually sold in this district, the demand was reported as very good, especially that for lime to be used in paper mills and tanneries. Prices were reported as much as 25 per cent higher than in 1917. The output of hydrated lime, manufactured principally in Wisconsin, amounted to more than 18,500 tons, a considerable gain over 1917. A small part of this quantity was manufactured in South Dakota. A quantity of lime is burned yearly at Duluth, Minn., from stone purchased in Ohio, but this is not included in the figures of this report.

Tenth District

The tenth district includes Tennessee and Kentucky, but Kentucky produces only a small quantity of lime for local use. The estimated output of this district in 1918 was 119,300 short tons, which was an increase of 16 per cent. This district was the only one to show an increase of output in 1918. The production of hydrated lime decreased from 18,594 tons to 16,975 tons, nearly 9 per cent, and was reported by the same companies as in 1917. The plants of the Wheeler Lime Manufac-

turing Co., near Nashville; the Interstate Lime Corporation, at Bristol; and the Clinchfield Portland Cement Corporation, at Kingsport, were new operations in this district in 1918. Other than for Government work there was little call for building lime. The demand for chemical lime in this district was reported as very good, especially for use in powder plants. The demand by sugar factories was reported as less in 1918 than in 1917. Prices of all kinds of lime were reported from 10 to 35 per cent higher than in 1917.

Eleventh District

The eleventh district includes Georgia, Alabama, and Florida, but for several years no lime has been manufactured in Georgia other than for local use. The estimates furnished by the Alabama producers for 1918 have not been as complete as could be desired, but from the data in hand the output of the district is estimated at 54,290 short tons, a decrease of 30 per cent. The output of hydrated lime, amounting to over 8,000 tons, also decreased, although one new hydrated lime plant was reported. In Florida one plant was idle and another reported operating for only a few months. Difficulty was experienced in carrying on operations owing to shortage of labor, cars, and fuel. Lime for building was reported as in good demand only by firms that furnished it for Government contracts. The sales of chemical lime were reported to be as good as in 1917, or better, and the output of agricultural lime was restricted by shortage of labor rather than by demand. Prices of all grades of lime were 25 per cent or more higher than in 1917, and operating expenses increased in proportion.

Twelfth District

The twelfth district, which comprises Arkansas, Colorado, Kansas, Nebraska, Oklahoma, and Wyoming, had an estimated production of lime in 1918 of 15,700 tons, a decrease of over 40 per cent. All the States in the district showed decreases in production. Arkansas, whose output is practically all building lime, had a decrease of more than 50 per cent. No lime is manufactured in Nebraska, and but little other than for local use in either Kansas or Wyoming. No hydrated lime is manufactured in any of these States. The general poor demand was reported for building lime, but chemical lime and agricultural lime were in about as good or better demand than in 1917.

Thirteenth District

The thirteenth district, including Texas and New Mexico, reported sales of more than 46,000 tons of lime in 1918, a decrease of 14 per cent from the sales in 1917. Nearly all of this lime is manufactured in Texas, whose

estimated output decreased 15 per cent, while that of New Mexico increased about 14 per cent. Most of the Texas lime is sold as building lime. The demand seemed to vary in different places, as of the five companies commenting on this class of lime, three reported large decreases—one of 80 per cent—whereas one company said that the demand was favorable during the first half of the year and very light during the last few months, and the fifth company reported the same demand as in 1917. The largest producing company in New Mexico reported about the same demand for building lime as in 1917. Large quantities of lime for the treatment of water were sold in New Mexico. The demand for chemical lime was variously reported as increased, as about the same as in 1917, and as very much less. Prices were reported as high by all producers. The 15,480 short tons of hydrated lime reported by three firms in Texas showed an increase of nearly 10 per cent over 1917.

Fourteenth District

The fourteenth district, which includes Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington, produced 92,700 short tons of lime in 1918, 36 per

cent less than the total for 1917, which was 144,976 short tons. California's output, which represents over one-half of the district's total, was 48,930 tons in 1918, a decrease of 37 per cent. Washington's estimated output of 15,570 tons represents a loss of 23 per cent, and Arizona's estimated output of 10,900 tons a decrease of 31 per cent. All the other States in the district showed decreases in output. Washington, California, Arizona, and Idaho gave an estimated production of 10,890 tons of hydrated lime, a decrease of but 2 per cent. The small demand for building lime due to war restrictions on the building trade was felt in this district as in all others. Much less lime was burned by and for the sugar factories than in 1917. In Arizona, Idaho, Nevada, Washington, and in some parts of California the demand for chemical lime was reported as less than in 1917, but three companies in California reported it as better. The demand for agricultural lime was said to be poor by the producers except one in California, who reported sales of twice as much as in 1917. The demand for other kinds of lime in this district was reported as about the same as in 1917.

Lime Association Convention Is Postponed Until June

Executive Committee Decides Meeting Is Premature at This Time

THE EXECUTIVE COMMITTEE of the Lime Association at its meeting in Washington, Thursday, January 23, decided that an annual meeting so soon after the organization of the Association would be premature, and unanimously agreed, after careful deliberation, that the annual meeting of the Association ought to be held in June. This conclusion was reached for the following reasons:

(1) The Lime Association has been in operation less than seven months. During four and one-half months of that time, its activities along promotional lines were discouraged by the War Industries Board and practically all of the work done by the Association during that period was in behalf of the War Service Committee and in securing priorities and preferences for members.

(2) The work necessary properly to prepare for and record the proceedings of an annual meeting requires several weeks of the undivided attention of the members of the Association staff. The programs planned in each of the three Bureaus of the Association since restrictions on our promotional work were removed by the War Industries Board, which programs are now actively under

way, require for their successful consummation uninterrupted continuity of action on the part of every member of the Association staff. These three programs look directly toward the immediate increase of lime tonnage.

(3) An annual meeting involves considerable expense to the Association. It was felt, by the Executive Committee that this money could be much more advantageously expended at this juncture in the prosecution of the legitimate purpose of the Association than in conducting an annual meeting. The Executive Committee has adopted as a watchword, "Economy and Tonnage" at this time and wishes the members of the Association to know that it was in the interests of these two necessary considerations that it has recommended to the directors, who have ratified the action, that the annual meeting be postponed.

In harmony with this action of the Board of Directors and of the Executive Committee, the Annual Meeting has been postponed until further notice. All reservations for hotel accommodations in Pittsburgh made through the Association were canceled.



NEW MACHINERY EQUIPMENT



Hand-Feed Steam-Operated Hammer Drills For 12-Ft. Holes

THE USE OF HAND-FEED hammer drills when operated by steam has seldom been attended by success for holes of more than about four feet in depth.

These drills have been used in the same way as machines operated by air, the steam passing down through the hollow steel to blow the cuttings from the holes. When the depth of hole reaches three feet, however, the cuttings have a tendency to bake and cling to the steel, and, as the hole grows deeper, this trouble becomes more pronounced, cutting down the drilling speed of the machine and requiring the frequent removal of the steel from the hole to clean out the cuttings.

The White Marble Lime Company, whose headquarters are at Manistique, Mich., is now quarrying 150 tons of dense dolomite per day at its quarry located at Marblehead, Mich., and is drilling the rock for blasting with one Sullivan "DP-33 Special Steam Rotator." The ledge method of quarrying is used, and holes 10 to 12 ft. in depth are required.

This special steam "Rotator" is equipped with a water tube which enters the shank end of the hollow drill steel for about one inch. The steam to operate this "Rotator" is furnished by a small, vertical, portable boiler, with an 18-gal. water tank mounted thereon. This tank is of the kind used in connection with standard Sullivan "DR-6 Hammer Drills" and with air driven, water tube "Rotators." A short length of 1/2-in. hose is led from the boiler to the top of this tank, putting pressure on the water. A small quantity of steam condenses, of course, but not an appreciable amount. A 50-ft. length of 3/4-in. steam hose is led from the boiler to the "Rotator," and a 50-ft. length of 1/2-in. water hose from the water tank to the drill. This forces water through the water tube of the machine, and thence through the hollow drill steel, to clean the cuttings from the hole.

A valve on the water hose near the drill regulates the amount of water used for cleaning the hole.

An asbestos covering is laced about the handle of the Rotator to protect the operator's hands from the heat. A short curved exhaust pipe directs the exhaust

steam away from the operator. The machine is otherwise steam tight, making it easy to operate.

An average of eight holes, or eighty feet, is drilled per shift. When the drilling is finished for the day, the portable boiler is hauled away a few yards, so that it will not be damaged by blasting. The rock is loaded in three-ton cars by hand and is hauled to the lime plant by a gasoline locomotive.

Crusher and Pulverizer in One Machine

A NEW PULVERIZER which will take large chunks of stone and reduce them to 20-30-40-mesh or finer, in one operation, has been placed on the market by the Williams Patent Crusher & Pulverizer Co., St. Louis, Mo. This new machine differs from the previous Williams' hammer mills in the type of hammer and in the speed at which it runs, which is about one-tenth of the speed of the small mills of the previous type. The speed of the new mill is only 350 to 450 r. p. m.

The momentum due to the speed of the older type crushers is gained in the newer type by much larger and heavier hammers. These hammers are made of solid pieces of manganese steel attached to their shaft by a patented spring cushion device. The grinding is done against a heavy manganese-steel apron, held in position by a spring device.

The manufacturer furnishes the following table of crusher-pulverizer opening, horse-power, and capacity when set to crush 1/4-in. material:

Portable		Speed R. P. M.	Horse Power	Weight Capacity	
No. Opening Mill	Inches			Pounds	Tons
1	5x10	350 to 450	5 to 10	2000	2
2	10x16	350 to 450	10 to 15	4500	8
3	12x24	350 to 450	15 to 18	6500	5
4	16x30	350 to 450	25 to 30	10000 to 12000	20



The new crusher-pulverizer machine

Baby Tripod Drill

THE WOOD DRILL WORKS, Paterson, N. J., has just placed on the market the "Brownie" drill. It is described by its makers as follows:

"This drill weighs but 83 lbs. and the tripod 65, and is easily handled by one man. It is designed especially for breaking up boulders for crushers and road work, small tunnel and sewer work and will drill to 7 ft. It is self-rotating; also has a self-tightening taper chuck key and wedge, (one blow from a light hammer tightens the steel or loosens it.)

"The cylinder and chest is vanadium-tungsten iron (the longest wearing metal known.) The front head is fitted with a long bronze bearing sleeve. The hose can be coupled to either side of the chest and exhaust from either side of cylinder. Hose can be put in chest or cylinder and the drill will run. It is absolutely 'foolproof.' No steam flying all over the operator nor cooked legs."



The Brownie tripod drill

The Rock Products Market

Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:

Cambria, N. Y.—(All thru 15 mesh) Analysis, CaCO₃, 93.94%; MgCO₃, 4.24% 2.00

Coldwater, near Rochester, N. Y.—(80% thru 100 mesh) Analysis, CaCO₃, 56.77%; MgCO₃, 41.74% 3.00

Danbury, Conn.—(50% thru 100) Analysis, CaCO₃, 96%; MgCO₃, 2%; ppr., \$4.50; bulk 2.75

Hillsville, Pa.—(90% thru 100 mesh) in 80 lb. ppr. bags, \$4.50; bulk 3.00

Jamestown, N. Y.—(90% thru 100 mesh)—Bags 2.50

Pownal, Vt.—(50% thru 100) Analysis, CaCO₃, 96%; MgCO₃, 2%; ppr., \$4.50; bulk 2.75

Walford, Pa.—(70% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 100% thru 10 mesh; 50% thru 4 mesh), paper sacked 5.00

Bulk 3.00

West Stockbridge, Mass.—(50% thru 100) Analysis, CaCO₃, 96%; MgCO₃, 2%; ppr., \$4.50; bulk 2.75

CENTRAL:

Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, CaCO₃, 96%; MgCO₃, 75% 2.00

Bedford, Ind.—(90% thru 10 mesh) Analysis, CaCO₃, 98.5%; MgCO₃, 0.5% 1.75

Columbia, Ill., near East St. Louis —(1/4" down) 1.25@1.80

Elmhurst, Ill.—Analysis, CaCO₃, 29.43%; MgCO₃, 20.69% 1.00

Greencastle, Ind.—(50% thru 50 mesh) Analysis, CaCO₃, 98% 1.75

Lannon, Wis.—(50% thru 50 mesh) Analysis, 54%, CaCO₃; 44%, MgCO₃ 2.00

Marble Cliff, O.—(50% thru 100 mesh) Analysis, CaCO₃, 86%; MgCO₃, 8% 3.00

Marblehead, O.—(50% thru 100 mesh; 60% thru 50 mesh; 100% thru 10 mesh)—Analysis (Min.), CaCO₃, 32.03%; MgCO₃, 3.75%. Bulk, \$3.00; ppr. 80 lb. sack 4.50

McCook, Ill.—(90% thru 4 mesh)75@1.00

McCook, Ill.—(100% thru 1/4" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru No. 100) Analysis, CaCO₃, 54.10%; MgCO₃, 45.04% 1.00@1.25

Miltoontown, Ind.—Analysis, CaCO₃, 98% 1.50

Montrose, Ia.—(90% thru 100 mesh) 1.25@1.50

Muskegon, Mich.—(50% thru 50 mesh) Analysis, CaCO₃, 53.35%; MgCO₃, 43.27% 1.50@2.00

North Industry, O.—(50% thru 100 mesh; and pulverized limestone) Analysis, CaCO₃, 91%; MgCO₃, 1.63% 3.00

Piqua, O.—(90% thru 100 mesh) 2.50@4.00

Rockford, Ill.—Analysis, CaCO₃, 53.75%; MgCO₃, 44.35% 1.25

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru 1/4" mesh) Analysis, CaCO₃, 89.61 to 89.91%; MgCO₃, 3.82% 1.50

Stone City, Ia.—(50% thru 100 mesh)50

Toledo, O.—Analysis, CaCO₃, 52.72%; MgCO₃, 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen) 1.80

Whitehill, Ill.—Analysis, CaCO₃, 96.12%; MgCO₃, 2.50%—90% thru 100 mesh, bags 5.00

90% thru 50 mesh, bulk 1.50

SOUTHERN:

Brooksville, Fla.—Pulverized limestone 1.80

Fletcher, N. C.—(100% thru 10 mesh) Analysis, CaCO₃, 90%; MgCO₃, 80%. Paper, \$3.75; bulk 2.25

Irrington, Ky.—(50% thru 4 mesh) 1.90

(Continued on next page.)

Wholesale Prices of Crushed Stone

Prices given are per ton. F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, 1/4 inch down	1/2 inch and less	3/4 inch and less	1 1/2 inch and less	2 1/2 inch and less	3 inch and larger
EASTERN:						
Auburn and Syracuse, N. Y.	.80	1.20	1.20	1.20	1.20	1.20
Buffalo, N. Y.		1.25, all sizes from stock piles.				
Burlington, Vt.		2.00@2.50	1.75@2.00		1.75	
Coldwater, nr. Rochester, N. Y.		Flux, 1.50@2.10			(local)	
Grove, Md.	1.50	2.25	2.10	1.90	1.50	1.35
Hagerstown, Md.		\$2.00 for all sizes				
Hull, Canada	1.20	1.20	1.20	1.05	.80	
North Leroy and Akron, N. Y.	\$1.00 for all sizes, including R. R. ballast					
Walford, Pa.	1.25	1.50	1.50	1.50	1.50	1.50
CENTRAL:						
Alden, Ia.	.20		1.00	1.00		
Alton, Ill.	1.85		1.45	1.35		
Chicago Switching District		1.30 cars to 2.35 by trucks, all sizes				
Columbia, Ill. (near E. St. L.)	1.25@1.80	.85@1.20	.95@1.30	.95@1.30	.80@1.20	
Detroit, Mich.		Various sizes \$1.50 per net ton				
Dundas, Ont.	.65	1.10	1.10	1.10	.90	.90
Eden and Knowles, Wis.	.80	.80		1.00	1.00	1.00
Ft. Wayne, Ind.		Various sizes \$1.60 per net ton				
Illinois, Southern	1.50	1.50	1.50	1.50	1.25	1.25
Greencastle, Ind.	.90@1.25	1.10	1.00	.90	.90	.90
Lannon, Wis.				1.10 all sizes		
Lewisburg, O.	1.00		1.10	1.00	1.00	1.00
Lima, Ohio	1.00			1.10 all sizes		
Linwood, Scott Co., Ia.	.50		1.13	1.05	1.13	
Mankato, Minn.		.75	.75	1.25	1.00	
Mayville, Wis.	.75	.75	.75	1.10	1.10	1.10
McCook, Ill.	1.00@1.25	1.50@1.65	.90@1.10	.70@.90	.70@.85	.70@.85
Montrose, Ia.		1.10@1.20	1.10@1.20	1.00@1.10	1.00@1.10	1.25@1.35
Oshkosh, Wis.		1.00 in all sizes, Blue Limestone				
Ottawa, Can.	1.90	2.00	2.00	1.75	1.50	
River Rouge, Mich.	.80@1.00	1.25	1.25	1.25	1.25	1.25
Rockford, Ill.	1.25			1.25	1.25	1.25
Sheboygan, Wis.				.80@1.00 for all sizes		
Sherman and Hamilton, Wis.		All sizes \$1.00 per ton				
Stone City, Ia.	.50	(1-inch 1.20)		1.10	1.00	
Toledo, Ohio	1.60	1.80	1.80	1.80	1.70	1.70
Toronto, Can.	.65	1.10	1.10	1.10	.90	.90
SOUTHERN:						
Brookville, Fla.	.50			2.50		
Cartersville, Ga.		2.40	2.30	2.20	2.10	2.00
Fort Springs, W. Va.	1.00	1.00	1.60	1.40	1.30	
		Railway ballast 1.10 per cu. yd.				
Irvington, Ky.	.75			.90	.90	
Mascot, Tenn.		1.00@1.25				
Stephensburg, Ky.			1.20 any size			
Winnfield, La.	1.20	1.80	1.80	1.80	1.80	1.80
WESTERN:						
Atchison, Kans.	.50	1.50	1.50	1.50	1.40	1.40
Carthage, Mo.	1.50	1.50		1.25	1.25	1.25
El Paso, Tex.				.90 for all sizes		
Kansas City, Mo.		1.35	1.35	1.35	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, 1/4 inch down	1/2 inch and less	3/4 inch and less	1 1/2 inch and less	2 1/2 inch and less	3 inch and larger
Baltimore, Md. (vicinity)	1.25	3.15	2.75	2.50	2.40	1.25
Birdsboro, Pa.	1.25	1.80	1.70	1.50	1.50	
Brantford, Conn.	1.00	1.40	1.40	1.35	1.25	
Duluth, Minn.—Trap	.65@.75	1.35@1.50	1.25@1.35	1.15@1.25	1.15@1.25	
Farmington, Conn.		.95	.95	.95		.90
Glen Mills and Rock Hill, Pa.	1.20	1.40	1.60	1.50	1.40	1.40
—Trap		R. R. ballast 1.40				
Little Rock, Ark.—Trap		1.75		1.75	1.50	1.35a
Millington, N. J.	1.75	1.85	1.75	1.75	1.60	
Montrose, Ia.—Trap		1.10@1.20	1.10@1.25	1.05@1.10	1.00@1.10	
Morristown, N. J.—Trap	1.85	1.75	1.75	1.60	1.40	1.40
New Britain, Conn.	.75	1.30	1.25	1.20	1.00	
North Brantford, Conn.—Trap	.80	1.30	1.25	1.20	1.10	
Richmond, Cal.—Trap			1.75	1.65	1.65	
Westfield, Mass.—Trap	.60	1.00	1.10	1.00	.90	

Miscellaneous Crushed Stone

City or shipping point	Screenings, 1/4 inch down	1/2 inch and less	3/4 inch and less	1 1/2 inch and less	2 1/2 inch and less	3 inch and larger
Fair Oaks, Calif.—Cr. Bldrs.	.85	1.05	.95	.85	.85	1.00
Hendlers, Pa.—Quartzite	.85	1.00	1.25	1.00	1.00	1.20
Little Falls, N. Y.—Syenite	.80	1.20	1.40	1.20	1.20	1.40
Richmond, Va. (Quarry)	1.00@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40@1.75	
Stephensburg, Ky.	1.00@1.26 per cu. yd.	any size	Basalt and other kinds			
Stockridge, Ga.—Granite	.50	2.50	2.50	2.25	2.25	2.00
Toledo, O.—Slag	.75@1.25	.85@1.40	.85@1.40	.85@1.40	.85@1.25	.85@1.25
White Haven, Pa.—Sandstone	1.00	1.20	1.40	1.20	1.20	1.20

*Cubic yard. †Agrl. lime. ||R. R. ballast. \$Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

Keystone, Ala.—(90% thru 50 mesh)	
Analysis, CaCO_3 , 99.50%; MgCO_3 , none	1.25
Ladds, Ga.—Analysis, combined carbonates, 96%—(All thru 10 mesh).....	3.5
Mascot, Tenn.—Analysis, CaCO_3 , 52%; MgCO_3 , 38%.....	2.50
(90% thru 100 mesh).....	1.75
(All thru 10 mesh).....	
Paper bags, \$1.50 extra per ton; burlap, \$2.50 extra per ton.	
Stephensburg, Ky.—Analysis, CaCO_3 , 98%.....	1.00 @ 1.50
Winnfield, La.—(50% thru 50 mesh).....	3.00
WESTERN:	
Cement, Cal.—Analysis, CaCO_3 , 95%; MgCO_3 , 1% (50% thru 100 mesh)....	4.00 @ 5.00
Elsberry, Mo.—(Pulverized) Analysis, CaCO_3 , 99.29%.....	1.85 @ 1.95
Fresno, Cal.—(All thru 40 mesh) Analysis, CaCO_3 , 98%; MgCO_3 , 1% (50% and 40% thru 200 mesh) sacked, \$5.50; bulk, \$5.00. (100% thru 40 mesh) sacked, \$5.25; bulk.....	4.75
Kansas City, Mo.—(50% thru 100 mesh).....	1.50

Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:

Berkeley Springs, W. Va.—Glass.....	2.50@3.00
Bowmanstown, Pa.—Glass sand.....	2.50
Cedarville, N. J.—Glass.....	1.50@4.00
Hellam, Pa.—Glass.....	2.00
Dundee, Ohio—Glass.....	2.00@2.50
Gray's Summit, Mo.—Glass.....	2.00@2.50
Kermitt, Va.—Glass sand:	
Washed.....	2.25@2.75
Crushed.....	1.75@2.00
No. 2.....	1.00@1.25
Mapleton, Pa.—Glass, damp.....	3.00
Glass, dry.....	3.50
Massillon, Ohio—Glass.....	2.00
Michigan City, Ind.—Glass sand.....	.30@ .40
Millington, Ill.—Glass.....	2.00@2.50
Mineral Ridge, O.—Glass.....	1.75@2.75
Montreal, Can.—Glass.....	4.00
Mountoursville, Pa.—Glass.....	1.25@2.00
Oregon and Wedron, Ill.—Glass.....	2.00@2.50
Ottawa, Ill.—Glass:	
Large contracts.....	1.75@2.00
All others.....	2.00@2.50
Sands, Elk Co., Pa.—Glass sand:	
Washed, wet.....	2.50
Selected, green.....	2.50
Silica and Pacific, Mo.—Glass.....	2.00@2.50
St. Mary's, Pa.—Glass sand—Green.....	2.50
South Vineland and Cedarville, N. J.—Glass.....	2.00
Sugar Grove, Ohio—Glass.....	2.00@2.25
Thayer, W. Va.—Glass.....	2.75
FOUNDRY SAND:	
Albany District, N. Y.—Molding.....	2.00
Allentown, Pa.—Moulding.....	1.40@1.50
Bowmanstown, Pa.—Molding.....	1.50
Cleveland, O.—Moulding.....	1.25@1.75
Cleveland, O.—Core, at pit.....	.33@ .75
Columbus, O.—Molding.....	1.50@2.00
Fleetwood, Pa.—Silica heating.....	2.15
Kansas City, Mo.—Core.....	1.00
Hellam, Pa.—Molding.....	2.00
Montreal, Can.—Molding.....	2.75@3.25
Mapleton, Pa.—Molding, damp.....	3.00
Molding, dry.....	3.50
Michigan City, Ind.—Core.....	.30@ .40
Millington, Ill.—Core, damp.....	1.50
New Lexington, Stamford and Layland, Ohio—Moulding.....	2.00@2.25
Ohio—Various points:	
Fine molding.....	2.00@2.25
Coarse molding.....	1.75@2.00
Shipments between Nov. 1 and April 1, 75c per ton added.	
Ottawa, Ill.—Sand blast sand.....	2.50@2.75
Ottawa, Ill.—Molding.....	.65@1.00
Utica, Ill.—Molding.....	.75@1.00
Wedron, Ill.—Molding.....	.75@1.00
West Albany, N. Y.—Molding.....	1.75@2.25
Zanesville, O.—Moulding.....	2.00@2.25

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Bowmanstown, Pa.		1.20	1.10			
Buffalo, N. Y.			1.00 cu. yd., all sizes			
Buffalo, N. Y. (Niagara River)	1.00	.85	.80	.80	.80	.80
Libby's Pit, Leed's Junct., Me.	1.00 @ 1.15	.50 @ .75	1.50	1.45	1.35	1.25
Morristown, N. J. (from stge.) .....	.70	.70	1.20	1.20	1.20	1.20
No. Wilbraham, Mass. ....		.50*	1.75*		1.20*	1.05*
Pittsburgh, and McKeesport, Pa.		1.25 @ 1.50			1.05	1.05
Washington, D. C. ....	.75	.75	2.00	1.70	1.40	1.20
Washington, D. C.—Wharves....		.75	2.00	1.40	1.20	1.20
CENTRAL:						
Algonquin, Ill.			All grades .50 per cu. yd. (3,000 lbs.)			
Barton, Wis. ....	.75	.70	1.00	.70	.70	.70
Beloit, Wis. ....	.40	.40	.50	.40	.40	.40
Chicago, Ill. ....		.95 @ 1.05			.95 @ 1.05	
Cincinnati, Ohio ....	.40 @ .50	.40 @ .50	.40 @ .50	.50 @ .60	.50 @ .60	.50 @ .60
Columbus, Ohio ....		.60	.50	.60	.60	.60
Des Moines, Ia.	50 @ 1.00	.50	1.50	1.50	1.25	1.25
Elgin, Ill. ....		.50	.50	.50	.50	.50
Escanaba, Mich.	1.00	1.00	1.20	1.20	1.20	1.00
Fort Dodge, Ia.		1.10	1.75			1.75
Hawarden, Ia. ....	.40 @ .60	.40 @ .60		.95 @ 1.25		.85 @ 1.00
Greenville and Mechanicsburg, Ohio ....	.50	.60	.60	.60	.60	.60
Illinois, Northern ....	.60	.60	.75	.60 @ .70	.60 @ .70	.60
Indianapolis, Ind. ....	.50	.50		.65	.65	.65
Janesville, Wis. ....		.50 @ .75			.50 @ .75	
Kalamazoo, Mich. ....	.50 @ .60	.50 @ .60	.50 @ .70	.60 @ .80	.60 @ .80	.60 @ .80
Mason City, Ia. ....	.60	.50	1.30	1.30	1.20	1.10
			Railway ballast and road work, .40		.70	
Milford, Ind. ....		.60				
Milwaukee, Wis.	1.06 for all sizes	.50*	.50*	(2,800 lbs. to cu. yd.)		
Minneapolis, Minn. ....		.50*	.75 @ .85	.75	.75	.75
Montezuma, Covington, Ind. ....	.75	.75	.60 @ .85	.50 @ .80	.50 @ .80	.50 @ .80
Niles, Mich. ....		.50 @ .80	1.00	1.00	1.00	1.00
Sabula, Ia. ....	.40 @ .60	.40 @ .60	1.00	1.00	1.00	1.00
Saginaw, Mich. ....	.95	.95	1.85	1.85	1.60	1.60
St. Paul, Minn. ....	.65*	.65*	1.75*	1.25	1.15*	1.15*
Terre Haute, Ind. ....	.75	.75	.85	.75	.75	.75
Wabash Valley District, Ind.			All sizes, .75.			.95
Winona Lake, Ind. ....		.75				.95
Winona, Minn. ....	.60 @ .90	.60 @ .90	1.00 @ 1.40	1.00 @ 1.40	.95 @ 1.25	.95 @ 1.25
SOUTHERN:						
Charleston, W. Va. (River)		1.20 @ 1.30	1.30	1.30	1.30	1.30
Lake Weir, Fla. ....	.50	.50				
Jackson and Roseland, La. ....		.50	1.00	1.00	1.00	
Knoxville, Tenn. ....	.90	.90	1.50	1.50	1.50	1.25
Pelzer, S. C. ....	.55					
Valde Rouge, La.		1.00*	2.25*	2.10*	1.75 @ 2.00*	
Waco, Tex. ....	.75	.75	1.20	1.20	1.00	1.00
WESTERN:						
Joplin, Mo.	1.00	.60	.45	1.50	1.25	2.00
Kansas City, Mo.			Car lots, building sand, @ .60; retail truck 1.50*			
Lincoln, Neb. (on cars)	1.00	1.00	2.10	2.10		1.90
Louisville, Ashland and Fre- mont, Neb. ....	.50	.50	Sd. & Gr. mix, 50% ret'd on No. 10 screen, .75			
Niles, Calif. ....	.60	.50 @ .70	.50 @ .70	.50 @ .70	.50 @ .70	.50 @ .70
Pueblo, Colo. ....	.80	.75			1.75	
Roche Spur, Tulare Co., Cal. ....			.35 River sand ¼ inch			
St. Louis, Mo.	1.20 @ 1.35	1.20 @ 1.25	1.50 @ 1.75	1.30 @ 1.40	1.25 @ 1.40	1.25 @ 1.35
San Francisco, Cal.			1.15 for all grades gravel.			
Seattle, Wash.	1.25*	1.25*	2.00*	1.25*	1.25*	1.25*
Vancouver, B. C. (Scows)		1.45*	1.70*	1.65*	1.65*	1.65*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
Attica, N. Y.	.50	.50	.60	.60	.60	.60
Boonville, N. Y.	.45 @ .60	.40 @ .60				.60
Burnside, Sand Pit, Conn.	All sand, .85	cu. yd.				.60
Lowell Junction, Mass.		.50* @ .75*				1.25*
Pittsford, N. Y.		.50				
Yardville, N. J.		.50 @ .75				
York, Pa.		.90 @ 1.10				
(crushed rock)						
CLEVELAND:						
Cleveland, Ohio			1.00 @ 1.75	bank sand		.60
Covington, Ind.					.85 for all sizes	.60
Escanaba, Mich.					Concrete mix, .55	
Indianapolis, Ind.						.50 @ .75
Jamestown, Wis.						.50
Milford, Ind.						1.75 yd. stge.
Moline, Ill.		1.50 yd.				.50
Portsmouth, Ohio		.65		.85		.50 @ .70
Sabula, Ia.						.60
Saginaw, Mich.—(River dock)	.50		1.20	1.20		.55 @ 1.00
Terre Haute, Montezuma, Ind.	.60				.60	
Toledo, Ohio						
Wabash Valley District, Ind.			.75 for all sizes			
Winona, Minn.			Pit run gravel under 2-in.,	.60 @ .90		
SOUTHERN:						
Howcote, La. (50% and up in rock content)						.65
Joplin, Mo.	.75	.60	.40			
Knoxville, Tenn.	.90					
Lindsay, Tex.			.44	.44		
Memphis, Tenn.	.65 @ .90	.65 @ .90			.85 @ 1.10	.85 @ 1.10
Sand and gravel mixed for concrete, .85 @ 1.10						
Sand Clay 50% metal on ¾" screen, .60 per ton						
Valde Rouge, La.						
WESTERN:						
Pueblo, Colo.						
S. Louis, Mo.						
Vancouver, B. C.						
River Run .60 unscreened						
	.85 @ 1.10			1.00 @ 1.25		1.40
		B Bank.	L Lake.	|| Ballast.		.85 @ 1.00

* Cubic yard. B Bank. L Lake. || Ballast.

Building Contracts Held Up by Treasury: More Money Needed

**Bids for Forty Post Offices 10 to 80 Per Cent Higher Than Estimates
—Application of Federal Farm Loan Principle to
Construction Work Is Urged**

NEW YORK.—While the United States Government is urging a general resumption of building construction to absorb the incoming fighters its own peace time construction program has been brought to a standstill by the high cost of labor, according to The Dow Service Daily Building Reports.

In January the Supervising Architect of the Treasury Department advertised for and received bids for the construction of 40 post office buildings. In every case the lowest bids have run from 10 to 80 per cent over the amount available for the work and the largest item in this excess construction cost is labor. The appropriations for these buildings, were, of course, made before the war. It is therefore impossible for the Treasury Department to award contracts at this time without immediate relief from Congress in the form of additional appropriations.

To meet this emergency the Committee on Public Buildings and Grounds has now under consideration the facts as submitted by the Secretary of the Treasury, recommending that the additional appropriations necessary to carry on the work be made as soon as possible.

Contractors say that in making their estimates they have had to figure in wage scales of from 10 to 30 per cent above those operative last year. In nearly every line of building materials reductions have been made, to meet the owner half way. The same applies to practically all of the building equipment lines.

For the first time in as many years as can be remembered building contractors are refusing to compete on jobs in the face of a potential building construction movement that is limitless as to size. The owners, on the other hand, say that there is no way in which they can go ahead with building construction plans, if construction costs are such as to make it necessary to further inflate rents. This spring will probably witness the peak of the high rent era if construction costs can be reduced so as to permit building construction to proceed, thereby relieving the dearth of dwellings, commercial and industrial space that makes it possible for rents to be high.

Suggest Federal Farm Loan Principle

Federal farm loan principles applied to a form of Government building subsidy will probably be laid before Con-

gress as a means of releasing the millions of dollars worth of construction that is being held up pending the adjustment of wage scales in a great many cities of the country.

Scenes at the custom house last week when thousands of foreign born men sought passage back to Europe, promised, if continued, still further to deplete the supply of labor in this country making it increasingly apparent that some federal action would be necessary to meet the new economic factors.

It is this continuously aggravated decline in the efficiency and the volume of existing labor that is rapidly putting the cost of construction far beyond the power of associations to cope with and make it necessary for some new agency to step in powerful enough to stabilize the labor market artificially if it cannot be effected by economics.

Building Material Market in New York

UNDOUBTEDLY the building situation is gradually readjusting itself each week bringing new evidence that renewed activity is close at hand, says the Record and Guide. Architects' offices are busy on plans for many new projects that will in all probability be started early next spring. During the previous week there had been quite a fair amount of new construction placed under contract and builders have many proposed operations to estimate upon.

Materials Market Quiet

The material markets are quiet, but with prices holding firmly to the levels of the past two or three months. At present there is little possibility of a decline in material prices and dealers are for the most part of the opinion that the existing high levels will be maintained throughout the coming year. Building material dealers report a steady gain to the volume of orders placed and while business is not nearly up to the normal of past years at this time, the improvement over recent inactive conditions is quite noticeable and it is predicted that from now on business will rapidly increase in volume.

Portland Cement

Since the termination of the Federal restrictions there have been no important developments in the cement industry.

Demand at present is seasonably low, but the outlook for greatly increased activity during the spring and summer months is excellent.

Manufacturers are generally engaged in planning for the unparalleled demand that is anticipated when building construction is really revived. The disparity between the stocks on hand and the expected magnitude of the demand is enormous and production must be stimulated in order to eliminate this disparity. The output of Portland cement during 1918 decreased materially, due wholly to the war restrictions on fuel supply, transportation, labor and other factors.

Rain and Prices Retard California Rock Sales—Bond Issue Coming

SAN FRANCISCO, CALIF.—During the month of January rock sales in central portion of California fall about 60 per cent. This is largely due to the fact that the rainy season interfered with construction work. No large contracts will be undertaken until the weather conditions are favorable.

Another cause for the present inactive condition are the prices of materials and labor. However, an investigation may disclose that the present prices will continue for some time.

In any event all realize that this condition is merely temporary for a large amount of building and construction work is contemplated as part of the reconstruction program. The State Legislature is considering submitting to the voters a bond issue for street improvement and State Highway work.

After a conference between the State Highway Commissioners and legislators, Jan. 24, it was implied that the issue will have to be between \$25,000,000. and \$30,000,000. This is necessary because of the extent of the road and an approximate increase of 60 per cent in the cost of labor and material, it is asserted.

A bill for a \$250,000. appropriation, part of a \$1,080,000. harbor improvement schedule, has been introduced. Los Angeles and Long Beach are to benefit.

The cement companies report that inquiries are quite numerous for large building projects in most all sections of the State.

Banner Year In Sight for California

SAN FRANCISCO, Cal.—This year promises to be the banner year for road building in California, the following counties having definite road improvement plans in process of consolidation: Santa Cruz, Sonoma, Solano, Yolo, Sutter, Butte and Colusa, not to mention Fresno County.



Passed By The Screens



Incorporations

The Diamond Potash Co., Lovelocks, Nev., with a capital stock of \$10,000, filed its charter to qualify to do business in Tennessee.

National Chemical and Refining Co., Augusta, Me.; mining, milling, smelting, refining, manufacturing and treating ores, minerals, chemical, etc.; capital \$300,000; par pfr. \$100. President, D. A. Leland; Treasurer, R. W. Farris; Clerk, C. L. Andrews.

Carson Hill Coal Mining Co., Cumberland, Portland, Me.; general mining, milling, smelting, quarrying, preparing for market all kinds of minerals, metals, etc.; capital \$1,000,000; no par value. President, S. S. Stevens; Treasurer, Gerry L. Brooks; Clerk, H. P. Sweetser.

Dolores Esperanza Corporation, \$2,000,000. Williamson, Burleigh & McLean, Augusta, Me. Explore, deal in minerals and ores of all kinds. President and Treasurer, E. M. Leavitt; Clerk, Ernest L. McLean; directors, E. M. Leavitt and Ernest L. McLean, all of Augusta, Me.

Acme Export and Import Co., Inc., Manhattan, N. Y. Deal in stocks, bonds, mines, collieries, quarries, agricultural products, timber, operate quarries; capital \$100,000; incorporators, E. A. Pita, 643 West 172d street, New York City; E. J. Higgins, 568 81st street, and J. R. Kenny, 1764 Bedford avenue.

Standard Ground Rock Phosphate & Fertilizer Co., Centerville, Tenn., capital \$100,000; A. H. Grigsby, Prest; S. S. Cunningham, Secy.-Treas. and Mgr.; will erect \$40,000 building; mill construction; open bids in May or June; install mills to grind rock, also engine, boiler, etc.; daily output 100 tons ground rock.

Mordecai Land Co. (Maine), \$50,000. Developing lands containing coal, pulp, wood, stone and all kinds of metals and minerals. President, Nathaniel Lord, Bangor, Me.; Treasurer, Frederic C. Dudley, Portland, Me.; Clerk, Lindley M. Webb, Portland, Me.; directors, Nathaniel Lord, Frederic C. Dudley and Lindley M. Webb.

National Chemical and Refining Co., \$1,000,000. Andrews & Nelson, Augusta, Me. Dealing in ores, minerals, elements and chemicals of all kinds. President, D. A. Leland; Treasurer, R. W. Farris; Clerk, C. L. Andrews; directors, R. W. Farris, M. F. Hearin, D. A. Leland, all of Augusta, Me.

Essex Oil Co., \$100,000. The Corporation Trust Co., Portland, Me. To search for and develop coal, clay, gravel, stone and all mineral lands. President, E. Connor; Treasurer, H. I. Smith; Clerk, A. B. Farnham; directors, H. I. Smith, A. B. Farnham, David F. Drew, Chas. W. Hamilton, all of Portland, Me.

W. B. Swartwout Company, Milwaukee, Wis.; Attorney H. R. Manger, Milwaukee. Manufacturing and dealing in cements and building materials, general building and contracting business, especially for bridges, curbs, flooring, paving highways, macadamizing streets, etc. Arthur Manger, Clara Manger, W. R. Swartwout, incorporators. \$5,000 capital.

New Red Beach Plaster Co., \$100,000. Lawyers Incorporation & Transfer Co., Kittery, Me. Produce and deal in plaster of paris, lime, stone, gravel, gypsum, clay, and all byproducts thereof. President, Harry W. Foster; Treasurer, George E. Burnham; Clerk, Elmer J. Burnham; directors, Harry W. Foster, George E. Burnham and M. E. Anderson, all of Kittery, Me.

Amalgamated Royalty Oil Corporation, \$3,000,000. The Corporation Trust Co., Portland, Me. Deal in oil, gas and other minerals and all sub-soil products and surface deposits of every description. President, E. Connor; Treasurer, H. I. Smith; Clerk, A. B. Farnham; directors, E. Connor, H. I. Smith, A. B. Farnham, David F. Drew, Chas. W. Hamilton, L. W. Merritt, J. W. Cady, all of Portland, Maine.

Quarries

Norfolk (Va.) county's stone quarry, near Emporia, Va., which has been inactive for some time, is to resume operations. The commission of roads and bridges has had great difficulty lately in obtaining stone at a reasonable rate for use in construction work, says a news report. The advantage of a 60 cent freight rate will be obtained, whereas the commission has had to

pay \$1.60 to have stone hauled from Roanoke. It has been tentatively planned to use part of the operating force at the quarry from the Norfolk county jail.

The Limestone Products Corp., Hamburg, N. J., has increased its capitalization from \$600,000 to \$700,000.

The Standard Blue Stone Co., 76 Montgomery street, Jersey City, N. J., has filed with the Secretary of State articles of dissolution.

The James H. Young Stone Co. has bought water front property at 105th street and Locust avenue, about 161 by 448 feet, New York City. Consideration said to be about \$135,000.

The Chesapeake and Ohio Railroad is now preparing to establish depositories for crushed limestone at different points along its line. K. T. Crawley, agricultural and industrial agent of the railroad, is actively engaged in preparations for this work.

The old electric power plant at the mouth of the Kill near Columbia, N. J., is being converted into a factory for making pulverized limestone. E. P. Boyle of Phillipsburg is manager and Robert Kurtz of Portland has been engaged as general foreman. He has a force of men at work reconstructing the buildings and placing machinery. Two switches from the N. Y. S. & W. R. R. nearby will run right into the building. It is stated that 20 men will be employed in the packing room, and it is estimated that as many more will be needed in other parts of the works.

Retail Dealers

Massey Concrete Products Corporation, Richmond, Va., establishes Wisconsin place of business at Port Washington Road, Station "C," Route No. 6, Milwaukee. A. P. Tamm, Superintendent. Dealers in cement, lime, limestone, plasters, artificial stone, general concrete work.

Hurd Nott Lumber Co., Merrill, Wis., has changed its name to Hurd Lumber Co. Dealers in retail fuel, lumber, cement, lime, building materials, etc.

The eleventh annual convention of the Retail Marble & Granite Dealers' Association of Pennsylvania was held on January 30, at the Penn-Harris Hotel, Harrisburg, Pa. "What is the Cost of Selling Work today?" was the subject of a talk by George Eisenbrown, of Reading. Other addresses were made by H. P. Hinman, Barre, Vt.; S. Hollister Jackson, Barre, Vt., and a talk by Edward Marnock, Quincy, Mass., on "The Opportunity the Retailer Has to Put His Business on a Par with Other Successful Merchants." A dinner was held at the hotel with Stanley Sullivan, of Philadelphia, acting as toastmaster. A number of four-minute talks were held on the monument industry. The officials of the organization are: President, George W. Colwell, Pittsburgh; Vice-President, J. M. Gessler, Philadelphia; Treasurer, George E. Detweiler, Phoenixville; and Secretary, H. A. Mason, Erie.

Cement

Tenders are being called for the erection of a \$5,000 one story office for the St. Mary's Cement Co., St. Mary's, Ont.

The Canada Cement Co. at Port Colborne, Ont., is closed down for lack of power. Now that work on the Welland Canal has been resumed this company has received numerous contracts. With other contracts there are enough orders to keep the plant running practically all 1919.

Over 200,000 barrels of cement were used in the construction of the New Commodore and Pennsylvania Hotels in New York, opened to the public during January; about 24,300 tons of plaster were also used. The structures were erected by the George A. Fuller Co. of New York, and are the two largest buildings of their kind in the world.

Gypsum Products

The Manitoba Gypsum Co. proposes erecting a chemical plant at Hatton, Sask. The President is Wm. Martin, 504 Trust & Loan Bldg., Winnipeg.

Sand and Gravel

Another plant has been added by the Greenville Co. at Mechanicsburg, O., pit.

The Perry Coal & Sand Co. of Columbus, O., has increased its capital from \$100,000 to \$250,000.

The McClain Sand Co., Fairmont, W. Va., has recently bought a new tow boat from the Kentucky & Ohio Transportation Co., for \$10,500.

The Pere Marquette gravel pit, says the Flint (Mich.) Journal has been leased to Geo. W. Cowles of Flint, who will engage in the manufacture of cement blocks.

The plant of the Lavino Refractories Co., on six acres of ground between Wolmelsdorf and Newmansdown, Pa., is being rushed to completion and when completed 200 men will have steady employment. The company controls 130 acres of land on which there are rich deposits of siliceous clay or ganister rock, discovered by Dr. H. M. Walters, of Mt. Penn, who is vice-president and general manager of the company.

Personals

Lieut. Phil K. Rodgers returned to Pittsburgh from Washington, D. C., February 1, having received his discharge from the army January 31. Lieutenant Rodgers has already resumed his duties as manager of the Rodgers Sand Co.

N. H. Battjes, recently elected to the executive committee of the Michigan Sand and Gravel Producers' Association, is general manager of the Standard Builders' Supply Co., Grand Rapids, Mich. The report that he represented the Battjes Fuel & Building Materials Co. was an error.

William Malcolm Miskelly, a director of the National Potash Co., has been elected a member of the Toronto City Council. Mr. Miskelly came to Toronto from Belfast, Ireland, 16 years ago and has taken a great interest in the National Potash Co., since its establishment.

OBITUARY

Jay S. Moyer, Bethlehem, Pa., one of the prominent local men in the slate industry, died January 26 at his home in Easton, Pa. He organized several concerns, among them being the J. S. Moyer Co., which corporation successfully operated the Old Bangor Slate Quarry for many years.

Archibald B. Erwin, 65, one of the best known business men of Upper Merion district, Pennsylvania, died suddenly January 21. He was an extensive limestone quarryman in the Port Kennedy district and active in the development of Upper Merion for many years.

Lime

The Elora White Lime Co., Elora, Ont., plans to build an extension to its plant.

The Castalia Agricultural Lime & Supply Co. (Ohio), recently organized by W. S. Kirkpatrick, will begin operations soon. The company acquired property near the L. E. & W. station and will turn out a fine grade of marl, rich in bicarbonate of lime, for fertilizing purposes. The first contract calls for 2,500 tons. The company expects to build a large new warehouse.

The Blue Diamond Plaster Co., Los Angeles, Cal., which recently leased a large frame warehouse building at Wilmington, is planning to demolish the structure and use the site for the construction of workmen's cottages, etc. The company has had plans prepared for extensive improvements in its lime kilns at Tehachapi and will build new warehouses at its plaster, mixing and sand plant in Los Angeles.

Manufacturers

The K-B Pulverizer Co., manufacturers of the crusher familiarly known as the K-B, recently removed from their former address, 86 Worth street, to 70-72 Worth street, New York City.

USED EQUIPMENT

ADVERTISEMENTS in this department are for the Sale and Want of Second-Hand Machinery and Equipment.

RATES: \$2.50 each column inch per insertion, check with order.

STEAM SHOVELS LOCOMOTIVES LOCOMOTIVE CRANES CARS RAILS HOISTING ENGINES GRAB BUCKETS CRUSHERS COMPRESSORS, ETC.

Try us for honest value in dependable "used" material of this character.

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Machinery

WILL BUY

- 1 Locomotive Crane, 8 wheel, 20 ton
- 1 Electric Hoist, 3 drum and slew

WILL SELL

- 2 Boilers, 80 h. p., locomotive fire box type
- 4 Steam Engines, 40 to 150 h. p.

Address

308 9th Street Des Moines, Iowa

FOR SALE

one 18-inch Bonnot Pulverizer, strictly first class order, immediate shipment

John D. Owens & Son Co.
Owens, Ohio

We Have for Sale TWO ROTARY DRYERS

In first class condition
for Immediate Shipments
HENRY H. WOOD, Inc.

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CRUSHERS
1—No. 21 Gates Gyratory
2—No. 12 Gates Gyratory
1—No. 10 Gates Gyratory
1—No. 10 Kennedy Gyratory
1—No. 9 Gates Gyratory
3—No. 8 Gates Gyratory
4—No. 7 1/2 Assorted Gyratory
6—No. 6 Assorted Gyratory
3—No. 5 Assorted Gyratory
8—No. 4, 3 & 2 Assorted
J. F. DONAHOO CO.

FOR SALE

PULVERIZERS
12—Hammer Pulverizers
15—Sets Crushing Rolls
35—Griffin Mills
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2—Symons Disc Crushers
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ASK US—WE HAVE IT

GRINDERS
1—60x84 Jaw Crusher
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8—Channeling Machines
Conveyors—Screens
Stripping and Loading
Shovels, Cars and Cranes
BIRMINGHAM, ALA.

WANTED

No. 3 Gyratory, McCully, Austin or Gates Crusher. Manganese head and concaves. Must be modern. State age, condition, price and where it can be inspected.

J. E. CARROLL SAND CO.
White Bldg. Buffalo, N. Y.

FOR SALE

One No. 8 Gates Gyratory Crusher, in first-class condition. Can be inspected at our Quarry, Fort Bellefontaine, Mo. Address

MISSOURI PORTLAND CEMENT CO.,
1502 International Life Bldg., St. Louis, Mo.

STEAM SHOVEL WANTED

Five-eighths yard dipper, full revolving, traction wheels; Bucyrus or Erie.

Address Box 1291, Care Rock Products

WANTED TO BUY

1 No. 9 Gates Crusher. Style "K" preferred.

SOUTHERN MINERAL CO.
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RAILS

All sections of new and second-hand, on hand for quick shipment. Also purchase old and abandoned plants for dismantling purposes.

M. K. FRANK, Pittsburgh, Pa.

Idle Machinery Absorbs Profits

This department is the medium for the men who keep the wheels going. Sell your idle machinery to the man who'll keep it going.

CRUSHERS

- 1—No. 4, 9"x15" Champion Jaw
- 1—No. 15, 10 1/2"x22" Champion Jaw
- 1—11"x22" Reliance Jaw
- 1—13"x24" Buchanan Jaw
- 1—No. 3, McCully Gyratory
- 1—No. 3, Power & Mining Gyratory
- 1—No. 5, Style "K" Gates Gyratory
- 2—No. 6, Style "D" Gates Gyratory
- 1—No. 6, Austin Gyratory
- 1—No. 7 1/2, Style "K" Gates Gyratory
- 1—No. 8, Style "K" Gates Gyratory
- 2—No. 9, Style "K" Gates Gyratory
- 1—No. 10, Style "K" Gates Gyratory
- 1—No. 21, Style "K" Gates Gyratory
- 1—60"x84" Power & Mining Superior Jaw, rope drive, with 300 H. P. Allis-Chalmers motor for 3 ph. 60 cycle, 2200 volt

Also Screens, Elevators and Rolls

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Complete small installation for hydrating, bolting and bagging lime. Capacity need not exceed twenty tons per day, but at low cost, and practically automatic and dustless, not reducing cores.

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Used steam drill and six brand new End Dump Steel Quarry Cars, two yard capacity, equipped to handle from either end or side. Manufactured by Austin Manufacturing Co.

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Charles City, Iowa.

WANTED

Air Compressor, belt driven, about 250 foot capacity. State full particulars and best cash price.

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New Steel
12, 16 & 20 lb.
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